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THE SEMINAL VESICLES

NEWER INSTRUMENTAL METHODS IN DIAGNOSIS AND THE THERAPEUTIC MANAGEMENT *

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While instrumentation of the ejaculatory duct and seminal vesicles was done by Klotz as long ago as 1885, and though many serious studies have been published on the subject, it may reasonably be asserted that the precise status of the seminal vesicle as a factor in disease remains to be determined.

Our objective, therefore, in this communication, one of a series of correlated researches which may be considered in the main as preclinical studies, has been, by means of improved and rational technical procedure, to render the seminal vesicles accessible to the same kind of study as, for example, is now the renal pelvis: in other words, to bring it within the spotlight—the searching scrutiny of orderly scientific investigation.

In the majority of our cases we are able to catheterize the ejaculatory ducts with the same type of catheters as are employed in ureteral work; in many of these, to obtain seminal vesicular secretion uncontaminated with prostatic secretion; to subject this isolated seminal vesicular secretion to microscopic and cultural investigation; to make routine seminal vesiculographic exposures, and, in cases indicating it, to perform synchronous ureteropyelographic and seminal vesiculographic exposures of the same side.

To understand the subject matter better, one must thoroughly familiarize oneself with the anatomy of the parts. The ejaculatory ducts average 15 mm. in length and 1.9 mm. in circumference. As they extend backward through the verumontanum and prostate gland, the lumen becomes larger until their division into the duct of the seminal vesicle and ampulla of the vas deferens, at which point the average circumference is 4.5 mm. At the orifice, the lumen is slit-like and as they progress through the prostate gland it becomes elliptic, the greater diameter being vertical; at their termination, the lumen is circular.

The course of the ejaculatory ducts is as follows: they take a very sharp dip through the verumontanum from the urethral orifices, at an angle of approximately 45 degrees to the urethral floor. For the first millimeter and a half the ducts diverge and then converge for the next millimeter or two, until there is a thin septum of fibrous and elastic tissue separating them. This wall is easily penetrated, even though soft, flexible instruments are used. They then run parallel to each other and usually at a less acute angle through the prostate gland, ending at the termination of, or within the substance of this gland. This anatomic deviation would seem to emphasize the unsuitability of rigid instruments and to justify their replacement with flexible catheters. This separating membrane is so friable that we have observed, in one or two instances, the introduction of a number 4 ureteral catheter in one side followed by the injection of an opaque medium, to result in a vesiculogram of the opposite side.

The lumen of the duct of the seminal vesicle measures 4.5 mm., whereas the lumen of the ampulla of the vas deferens has a circumference of 3.1 mm.; noting the circumference of the ejaculatory duct at its termination, these measurements may somewhat confuse one. The similarity in size of the lumen of the ejaculatory duct with that of the seminal vesicle is accounted for by the fact that the ampulla opens on the mesial aspect of the ejaculatory duct. The duct of the seminal vesicle is a direct continuation of the ejaculatory duct, whereas the ampulla is a tributary. This anatomic fact explains why the ejaculatory duct catheter enters the first saccule of the seminal vesicle and in none of our cases was seen to enter the ampulla of the vas deferens. This is contrary to the opinion expressed by Young. The seminal vesicle in every instance was distended prior to the ampulla of the vas deferens and vas, when solutions were injected through the ejaculatory duct. In several of our cases not alone were the seminal vesicle, ampulla of the vas deferens and vas injected, but even the tubules of the epididymis were visualized. This fact does not coincide with the opinions of Belfield and Rolnick.

APPARATUS AND TECHNIC

To facilitate the catheterization of the ejaculatory duct, it is essential that an instrument be used which will direct the catheter to take the same relative course that the ejaculatory duct takes through the verumontanum and prostate gland. For this purpose the McCarthy ejaculatory duct catheter carrier, with spring wheel deflector, is necessary.[1] It is composed of three parts, the sheath, obturator, panendoscopic telescope and the ejaculatory duct catheter carrier. The sheaths are a number 24 F. and a number 26 F. whose circumference is more circular than the ordinary panendoscopic sheath. The telescope is slightly modified to admit this carrier, a new departure in urology, for with its use catheterization of the ejaculatory ducts and therapy to the seminal vesicles in indicated cases is rendered a simple procedure.

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1. This instrument would not have been possible but for the inventive genius of Mr. Reinhold Wappler of the American Cystoscope Makers, Inc., New York.

There are two fixed channels through which a number 4 and a number 6 F. catheter can be passed. The distal end of the carrier with its spring roller deflector directs the catheter in the same relative course that the ejaculatory duct takes through the verumontanum. The proximal end is constructed so as to permit the rotation of the telescope whereby the catheter and the ejaculatory duct orifice may be brought into view without the necessity of rotating the outer sheath, decreasing to a minimum the possibility of traumatizing the verumontanum. A soft flexible ureteral catheter is introduced into the ejaculatory duct orifice and the instrument rotated, directing the catheter toward the lateral wall of the duct, which is firmer and less easily penetrated than the thin friable septum between the two ducts. It is necessary to tilt the instrument to an angle of approximately 45 degrees so that the catheter may take a downward course, avoiding penetrating the posterior aspect of the verumontanum. After the catheter has been passed 2.5 cm. or more and the eyes of the catheter are within the lumen of the ejaculatory duct, it is reasonable to expect to obtain some of the uncontaminated seminal secretion. After a few moments, should no secretion appear, it is permissible to inject 1 cc. of sterile saline solution, which will dilute the viscid seminal secretion permitting it to flow through the catheter. At this time, should a vesiculogram be desired, a 5 cc. syringe containing 5 cc. of a radiopaque solution is connected up with the catheter by a hypodermic needle. After 1.5 cc. of the solution has been injected, the medium may be seen returning from the seminal vesicles about the catheter at the ejaculatory duct orifices. This does not signify that the seminal vesicle is completely distended. It is best to continue the injections until 5 cc. has been introduced so as to replace the vesicular secretion or become a homogeneous mixture with it casting a shadow.

To aid further in the visualization of the seminal vesicles and its ducts, the emptying of the bladder of all solutions and the introduction of 100 cc. of air is of great value. In order to avoid the overlapping of the seminal vesicles by the pubic arch, the patient's shoulders should be raised about 10 degrees from the table and the x-ray tube left in the usual position while the exposure is being made.

Various opaque solutions have been advocated for vesiculography, including colloidal silver and iodized oil. In our experience, sodium iodide, colored with a

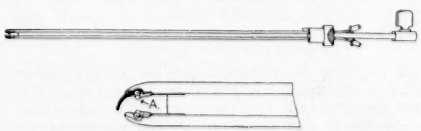

Fig. 1.—McCarthy ejaculatory duct catheter carrier: *A*, spring roller used for deflecting catheter.

dye of either indigo carmine or methylthionine chloride, U. S. P. (methylene blue), in as concentrated a solution as 30 per cent, has been found to be most satisfactory. This solution causes little or no irritation unless extravasation occurs. In the few instances in which this has occurred, no untoward effects have been noticed. The colored solution permits one to note the escape of the solution at the orifice of the ejaculatory duct.

Since 1925, we have studied several hundred seminal vesicles with the hope of arriving at a definite conclusion relative to determining the appearance of a normal seminal vesiculogram. It was therefore thought advisable to obtain cultures of the seminal secretion, examine this secretion microscopically, and make notations relative to the rectal observations, noting at the same time any pathologic conditions existing in the epididymis or vas deferens which would aid in diagnosing a case of seminal vesiculitis clinically.

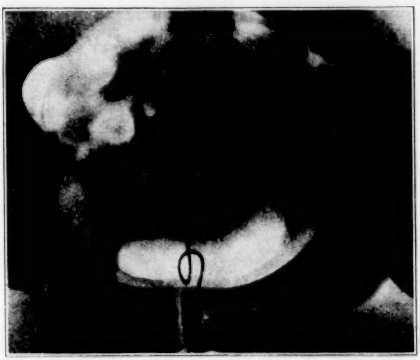

Fig. 2 (patient S.).—Catheter coiled in right seminal vesicle: seminal vesiculogram demonstrating some congenitally large saccules with abnormal dilated saccules of the ampulla.

SUMMARY OF FIFTY CASES

According to the investigation of Habute, there are definite changes in the appearance of the seminal vesicles at the various decades of life. We have vesiculograms in adults ranging from the ages of 21 to 56 but were unable to ascertain any appreciable anatomic changes referable to this expanse of thirty-six years. We have had the good fortune of seeing the seminal vesicles of the new-born and on through life up to and over the alloted three score years and ten, and noted no changes particularly significant in any decade of life other than growth.

Of the vesiculograms here presented, fourteen were normal. These conclusions were drawn from the fact that the individual saccules were definitely outlined. The ejaculatory ducts, ampulla of the vas deferens and, in some instances, even the epididymis, was seen to be injected. Cultures obtained were negative; microscopic examination of the seminal secretion was negative. The presenting symptoms were not referable to a vesiculitis.

To consider the seminal vesicle normal it is necessary to note a homogeneous distention of the individual saccules, the definite outlines of which are demonstrated. Uncontaminated cultures obtained from the seminal vesicles were reported negative. Microscopic examination of the seminal secretion was also found negative. It was thought advisable to determine the emptying time of the normal seminal vesicle. For this purpose roentgen exposures were made one and two hours after the injection. It was found that normally the seminal vesicle was empty after two hours. This should not lead one to conclude that the seminal vesicle is constantly draining; we feel that a peristaltic contraction is produced as the result of the injection of a foreign substance, and for this reason the vesicle empties, as stated. The hypertonicity of the injected medium is probably the underlying factor here.

Congenital defects or arrests were noted in six cases.

In Sargent's report he states that the seminal vesicles are alike on the two sides and that when there is a difference in the two sides it may be concluded that a pathologic condition exists on one side. Case 45 shows a definite congenital arrest as compared to the opposite side. This patient gave no symptoms referable to disease of the seminal vesicles, nor have we clinically been able to note any pus or organisms present, nor any rectal evidences of disease. We have noted that this case, plus several specimens examined at autopsy, showed variations of the two sides.

There were six cases of a large, atonic type of seminal vesicles from which the secretion was found to be negative to culture and microscopic examination; these were in individuals presenting symptoms of spermatorrhea with a history of prolonged masturbation.

There were thirteen cases of chronic seminal vesiculitis demonstrating the contracted and dilated type.

The contracted type of chronic seminal vesiculitis seen in seven cases showed the ejaculatory duct normal, the saccules of the seminal vesicles incompletely distended, some apparently occluded and no evidence of dye present. However, some of the saccules are sharply defined with definite decrease in size. The large patulous type of chronic seminal vesiculitis again demonstrates a fairly normal ejaculatory duct. However, the individual saccules of the seminal vesicle are dilated.

One instance of a large chronic seminal vesiculitis causing definite pressure on the lower end of the ureter gave evidence of obstruction to the overflow of urine, the patient presenting symptoms referable to ureteral colic.

One case of acute urinary retention occurring in a young subject was found to be due to enormously enlarged seminal vesicles.

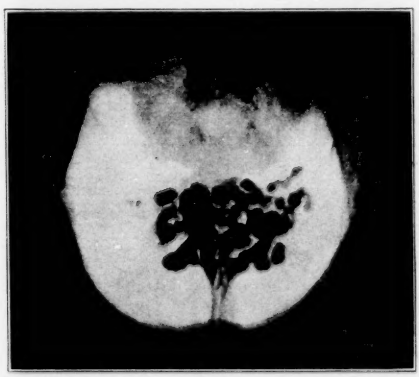

Fig. 3.—Bilateral normal vesiculogram demonstrating ejaculatory ducts, ampulla of the vasa, seminal vesicles and vasa of M. C., a man, aged 31, treated for urethritis, who complained of a slight morning urethral discharge. Smears were negative. Specimens obtained from the seminal vesicles showed living spermatozoa. No pus cells. Cultures were negative.

It is possible to have a chronic inflammatory condition causing anatomic changes in all or part of the seminal vesicles; in other words, the proximal saccules may show pathologic changes, whereas the distal saccules will be normally outlined, and vice versa. There were two cases of gonorrheal arthritis in which the vesiculogram showed changes which were interpreted as subacute seminal vesiculitis because of the fact that the vesiculograms were on the borderline with the seminal secretion containing clumps of pus.

There was one case of proved tuberculous seminal vesiculitis with abscess; this case, through discussion as

Fig. 4 (patient H.).—Congenital tubular type of seminal vesicle with evidence of chronic dilated seminal vesiculitis of the left seminal vesicle.

to the proper interpretation, led one of us to do a vasotomy and inject our material in this manner. On roentgen exposure the solution was seen to outline the vas up to a fixed point and then extravasate into the abscess cavity, confirming the opinion that a solution in the continuity of the lumen of the vas deferens had occurred. There was an interesting case of sterility in which catheterization of the ejaculatory ducts yielded brown pigmented material in which numerous nonmotile spermatozoa were seen. When the opaque medium was injected and a vesiculogram obtained, there was a definite dilatation of the ejaculatory duct, which was due to a partial occlusion of the ejaculatory duct lumen.

In twenty cases we were successful in obtaining seminal secretion for examination, and on culture a nonhemolytic streptococcus, Streptococcus viridans, Staphylococcus albus, a diphtheroid organism and Staphylococcus aureus were found. An unidentified gram positive coccus was reported on several cultures. Von Lichtenberg stated that he found a similar organism in his studies. In five cases, though pus cells were demonstrated in the smears, cultures were negative. In one case, definitely proved to be tuberculous, no organisms were seen in the secretion. We can only assume that in a good number of the negative cultures the gonococci, which should be most frequently encountered, were not obtained. This is probably due to faulty technic in the use of the culture medium.

COMPLICATIONS

In a small percentage of our patients, subacute epididymitis occurred. This usually appeared twenty-four hours after instrumentation. However, it was not as severe as the epididymitis caused by infection, and usually subsided in thirty-six hours with mere support. In none was there evidence of acute hydrocele. The epididymis itself was enlarged, tender—not acutely so—

with no evidence of accumulation of fluid in the tunica vaginalis. In no instance did this condition progress further than that of a chemical epididymitis. In no case have we observed residual nodulation.

A second complication is that of extravasation of the iodide into the surrounding tissues. The patient complained of severe pain as soon as it occurred and injec-

Fig. 5 (patient S. S.).—Seminal vesicle approximal sacculations definitely outlined; cephalic saccule confluent and smooth. Culture shows Bacillus coli. The epididymis is definitely outlined in this picture. Diagnosis, chronic seminal vesiculitis.

tion was stopped immediately. Within ten minutes after removal of the instrument, all pain had subsided and no untoward complications were noted on subsequent examination.

These are the only complications encountered, and it is therefore fair to assume that this procedure is a safe, rational diagnostic and therapeutic measure.

Contraindications to any type of urethral instrumentation should be considered as the only objections to vesiculography.

INDICATIONS FOR VESICULOGRAPHY

Catheterization of the ejaculatory ducts together with the collection of the uncontaminated seminal secretion, generally speaking, should be reserved for refractory cases of seminal vesiculitis not responding to the usual therapeutic measures. The specific indications are as follows:

1. Chronic arthritis—when other foci have been eliminated and the seminal vesicles are suspected.
2. Persistent chronic posterior urethritis with evidence of verumontanitis and microscopic evidence of pathologic changes in the expressed secretions.
3. Vague indefinite backaches—undetermined by the usual measures.
4. Impotentia.
5. Sterility.
6. Sexual asthenia with large palpable vesicles to determine patency of the ejaculatory ducts.

CONCLUSIONS

1. The seminal vesicles are a possible focus of infection.
2. This new ejaculatory duct catheterizing endoscope has rendered catheterization of the ejaculatory ducts a routinely feasible procedure.
3. Vesicular secretion, uncontaminated by prostatic secretion, is obtainable for chemical and bacteriologic study.
4. Seminal vesiculography is a diagnostic aid.
5. Seminal vesicular lavage is a practical procedure.
6. The ampulla of the vas deferens is lavaged when solutions are injected by any of the ejaculatory ducts.
7. Medication administered through the ejaculatory duct in some instances reached the tubules of the epididymis.
8. In cases of incomplete drainage of the vesicle, gradual dilation with small, soft, flexible bougies or catheters was of greater value than any procedure heretofore advocated.
9. The contour of the seminal vesicle is changed as the result of pathologic conditions.
10. Ejaculatory duct catheterization plus vesicular lavage definitely relieves symptoms.
11. Seminal vesiculitis may cause ureteral obstruction.

Though these studies have been basic and preclinical in character, certain interesting observations have been noted and a few experimental studies essayed. The most frequent question asked by our colleagues has been "What solution do you employ for vesicular lavage?" The answer is that we have purposely deferred this study until the completion of the present work. Incidentally, however, it has been observed on a number of occasions that obscure backache or perineal pain was completely relieved by the passage of the catheter in the taking of a vesiculogram.

In conjunction with Dr. John A. Killian, director of biochemistry, and Dr. C. Travers Stepita of our department, studies were made of the relative motility and viability of the spermatozoa. In this investigation motility was experimentally inhibited. It was then found that, by the addition of various biochemical solutions, they could be revitalized and their normal motility restored and increased.

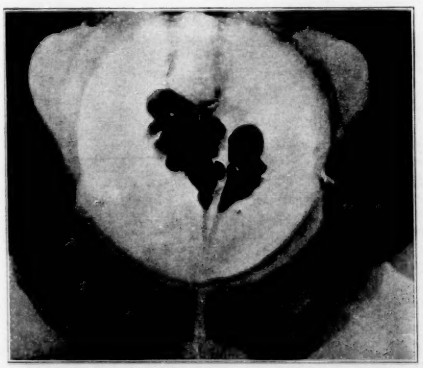

Fig. 6 (patient G.).—Chronic left seminal vesiculitis: Bilateral vesiculogram in a patient presenting a history of left epididymitis in whom smears show many pus cells from the left seminal vesicle. Left vesiculogram shows a failure of filling of cephalic saccule due apparently to either occlusion or pus.

From these studies it was deduced that, by the introduction of such solutions into the vesicles of the patient with sluggishly motile spermatozoa, their normal motility could be restored in vivo.

Furthermore, it was thought that through the use of these solutions, proved so favorable to the motility of the sperm, normal spermatic fluid could be diluted with

such solutions, thus rendering it possible to inject this mixture directly into the vesicle. This has been carried out in a small series of patients, in some of whom normally active spermatozoa have later been recovered.

This study is of too recent origin for us to assert that fertility may thus be simulated by the azoospermic vesicle; rather is it our intention to make its technical feasibility a matter of record.

Intra-uterine instrumental insemination has, for obvious reasons, been most disappointing in its failures. This method of what might be called two-stage insemination, with its accompanying physicopsychic phenomena, holds out much of promise.

It is our conviction that, with the equipment here described, in the hands of trained instrumenteurs who are also experienced clinicians, the diagnosis and therapy of seminal vesicular conditions will be as precise as they have heretofore been empiric.

2 East Fifty-Fourth Street.

THE SEMINAL VESICLES AND THE EJACULATORY DUCTS

HISTOPATHOLOGIC STUDY *

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This gross and histopathologic study of the seminal vesicles and ejaculatory ducts constitutes one feature of a comprehensive and correlated study of these structures, carried out under the supervision of Dr. Joseph F. McCarthy, director of the Department of Urology at the New York Post-Graduate Hospital. To date, about eighty-four bladders have been subjected post mortem to careful serial microscopic examination of the region between the verumontanum and the interureteric ligament. The sections have been made transversely and sagittally, in such a manner as to include the prostate, ejaculatory ducts and seminal vesicle in their normal relationship to one another. These bladders have been selected from hundreds of necropsies, because of definite gross observations indicating acute, subacute and chronic inflammation of the entire region. An opportunity was thus afforded to study the verumontanum, ejaculatory ducts and seminal vesicles in specimens which presented frank inflammatory lesions of the posterior urethra and upper urinary tract.

Parallel with the microscopic studies of the entire posterior urethral region, gross studies of many hundreds of dissected seminal vesicles were carried out, with special reference to the incidence of gross observations of fibrous perivesiculitis. Cellodin casts of the seminal vesicle, ampulla and ejaculatory duct gave an exact method for determining the varying configuration and gross anatomy of these structures under normal, anomalous and acquired pathologic conditions. The tremendous normal variations in the form, capacity and lumen of the convoluted seminal vesicle tubule, the incidence of sacculations, and the position of the ejaculatory duct in relation to the duct of the seminal vesicle and the terminal portion of the ampulla were thus made amenable to study, making possible observations that are essential for an intelligent understanding of the normal anatomy and physiology of these structures. In the marked normal variation in gross anatomic structure revealed by these studies, numerous configurations and anomalies presented themselves, which were obviously important as predisposing factors for the development of an inflammatory pathologic condition and the subsequent course of such an involvement, once established. Although the minutiae of this study included a great amount of detail requiring separate consideration, information of clinical value was easily extracted from the mass of data possessing only academic interest.

These gross and histopathologic studies were undertaken because the pathology of the seminal vesicles has not received the study it deserves. The normal structure of the ejaculatory duct and the verumontanum has only recently been given adequate study, but the microscopic pathology of these structures has not previously received attention in keeping with the clinical interest and importance of the subject. The application of general pathologic concepts to seminal vesiculitis and inflammation of the ejaculatory duct, although sound in principle, must take cognizance of specific gross and minute anatomic structure peculiar to the region. As applied to the seminal vesicle, the chief pathologic problem is not the marked destructive suppurative involvements of the prostatic and seminal vesicular regions (which clinical experience and pathologic knowledge accept as being productive of marked tissue reaction, with permanent cicatrization at the expense of normal structure) but rather the incidence, type of reaction, chronicity and extent of involvement of these structures during the course of and subsequent to low grade chronic posterior urethritis and adnexitis. Is chronic latent seminal vesiculitis a frequent cause of morbidity? Does chronic infiltrative involvement of the seminal vesicle wall occur frequently with the ordinary forms of prostatitis and seminal vesiculitis? Does marked fibrous perivesiculitis commonly accompany chronic prostatitis and cicatricial posterior urethritis?

What are the types of pathologic response in the ejaculatory ducts, with different degrees and stages of inflammation in the posterior urethra, prostate and seminal vesicles? Does permanent or intermittent obstruction occur commonly either because of fibrous infiltration of the ejaculatory duct walls or because of congestive and edematous swelling?

The answers to these questions entail a knowledge of pathogenesis of the inflammatory involvements of the entire region. Necropsy studies of material demonstrating the different stages, degrees and types of inflammatory response in all the adnexal structures must give a more accurate conception of the entire picture than can be obtained from clinical observation alone. Nevertheless, the ideal mode of approach to the answer of these interesting problems must be by the avenue of careful gross and microscopic study of necropsy material, with an interpretation based on an extensive and profound clinical experience with the types of infection under discussion.

Clinical experience has shown that all the adnexa are closely related in their response to infectious injuries. It has therefore been taken for granted that the ejaculatory ducts must be affected by inflammatory

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* Read before the Section on Urology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

infiltrations similar to those that are clinically demonstrable in the contiguous structures. The ready inflammatory response of the verumontanum is perhaps the most striking picture in posterior urethroscopy, and this indirect observation, rather than instrumental or microscopic evidences, has led to the general belief that

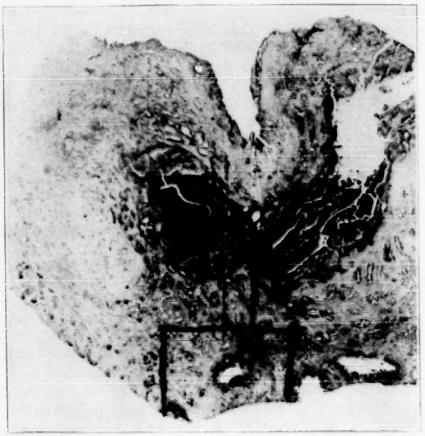

Fig. 1.—Transverse section through the prostatic urethra in a specimen showing prostatic abscess. Marked acute inflammatory reaction throughout the entire prostate, especially marked in the region of the destructive suppurative focus

infiltrative and edematous closures of the ejaculatory ducts are not uncommon occurrences.

The gross studies of our specimens revealed very few visual or tactile criteria for the recognition of a chronically inflamed seminal vesicle. Except in a few frank cases of perivesicular infiltration and suppuration, little gross evidence could be found on which to venture an opinion as to the probability of microscopic seminal vesiculitis. The impression of perivesicular infiltration was simulated by varying development of fibro-areolar supporting tissue, which on more careful dissection was found to have no intimate adhesive relation to the seminal vesicle. The gross impression of a thickened, sclerosed seminal vesicle wall was frequently dispelled on subsequent microscopic examination, at which time the vesicular musculature was found to be quite normal, although frequently increased in thickness. The striking difficulty encountered in the recognition of a pathologic seminal vesicle in the gross visual and tactile examination of the specimen serves to emphasize the clinical difficulties in digital rectal diagnosis of chronic seminal vesiculitis.

A marked variation in the thickness of the vesicle wall was noted; in some specimens the wall was very thin, while in others it was so thick that the gross impression was that of sclerosis. It seems noteworthy that in one instance thin distended vesicles were found associated with a frank, atonic, thin, neurogenous bladder (cord injury). However, the impression derived following the microscopic studies was that functional and neurogenous factors, rather than inherent infiltrative lesions of the vesicle wall, caused much of the marked variation in the consistency and thickness of the vesicles examined.

The most reliable gross criteria of the probable presence of chronic seminal vesiculitis were found in the prostatic urethra. Subsequent microscopic study of the seminal vesicle revealed that chronic inflammatory pathologic changes were most frequent in those cases showing frank advanced sclerosis of the posterior urethra and vesical neck, cribriform deformity in the region of the verumontanum, and dilated sclerosed, patent, prostatic ducts, with or without distortions of the size, shape and position of the verumontanum. The size and consistency of the prostate were helpful only as they served to corroborate the impression of widespread chronic inflammation of the entire region, derived from the examination of the mucous surface of the posterior urethra and bladder neck.

In not a single instance did digital pressure on the seminal vesicles fail to cause an escape of secretion through the orifices of the ejaculatory ducts. This was considered ample evidence of the anatomic patency of the ejaculatory ducts. However, it is understood that such a maneuver does not stimulate the physiologic emptying and transmission of secretion from the seminal vesicles to the posterior urethra. It does not preclude the possibility of intermittent occlusion during life occasioned by infiltrative and edematous lesions of the ducts nor does it give any indication as to functional disturbance of the musculature of the seminal vesicles.

From the foregoing it is evident that careful microscopic examination was necessary to determine the presence or absence of pathologic changes in the seminal vesicles and ejaculatory ducts in those specimens in which gross anatomic observations suggested inflammatory involvement of the entire posterior urethral region. Confusion was caused by the microscopic picture resulting from the sectioning of the irregular convoluted and sacculated vesicles as well as its ducts and ampullae of the vas. The villous arrangement of the mucosa of these organs also served to complicate the picture, and in a single section different portions of the vesicles would be cut in different planes resulting in microscopic

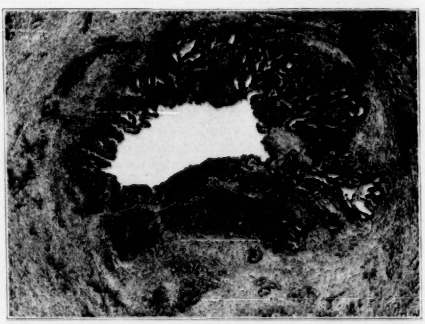

Fig. 2.—Higher magnification in the region of the ejaculatory duct (of figure 1), showing marked engorgement of the blood vessels in the wall, with large perivascular accumulations of polymorphonuclear leukocytes and plasma cells. Similar cellular exudation in the submucosa and between the mucous folds in the lumen.

observations which simulated obliterative changes, growing together of the villi and closed off superficial recesses. Such microscopic criteria have been erroneously described as characteristic of chronic vesiculitis. Because of the frequency of these observations without any other microscopic evidences of inflammation, it

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was concluded that more definite criteria were necessary in order to decide that a vesicle was pathologic. The presence of polymorphonuclear, plasma or round cells in the lumen, between the mucous folds and in the submucosa, with perivascular round cell infiltration about newly formed and engorged blood vessels in the submucosa, muscularis and surrounding fascial planes, was considered necessary to establish a microscopic diagnosis of vesiculitis. Increase in fibrous tissue and variation in elastic tissue were determined by the use of differential stains.

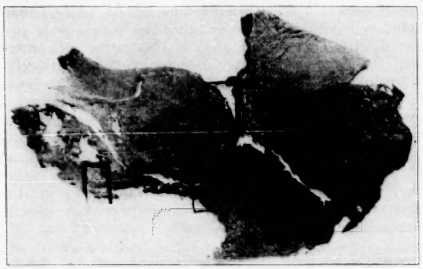

Fig. 3.—Large sagittal section showing active subacute inflammation of the posterior urethra, prostate, ejaculatory duct and seminal vesicle.

Because of their intimate anatomic and functional relationship the pathologic changes of the seminal vesicles, ejaculatory ducts, utricle and verumontanum must be considered together. Since the ejaculatory ducts course through the prostate, the pathologic changes in the latter organ cannot be ignored when one is considering the morbid changes in the former.

By far the most common form of seminal vesiculitis is produced by regional extension following posterior urethritis. Infection of the blood stream is possible, as is secondary involvement from a focus in the epididymis (tuberculosis). However, the most common form is the result of direct extension complicating infection of the posterior urethral surface. Regional extension occurs by continuity of the mucosal surface, as well as by means of lymphatic invasion. In relatively mild posterior urethritis of gonorrheal or nongonorrheal etiology, the juxta-urethral structures alone are involved. In more virulent or constantly repeated mild infection of the posterior urethra, regional extension occurs to the more remote points in the adnexal structures. Minute anatomic structure plays an important part in determining the chronicity and type of tissue reaction.

It is therefore obvious that infection of the prostate glands usually occurs concomitantly with infection of the ejaculatory ducts and the accessory gland structures. In mild inflammations, the involvement may be juxta-urethral both in the prostatic and in the seminal tracts. In more virulent infections, the inflammatory processes in the deeper recesses of the prostate and seminal vesicles cannot fail to be accompanied by similar involvement of the juxta-urethral structures. As applied to the seminal vesicle and ejaculatory duct, our studies showed that seminal vesiculitis of any severity was never seen without definite, marked inflammation of the ejaculatory duct. However, not infrequently, mild chronic surface urethral inflammation with low grade chronic prostatitis and inflammation of the glands of the verumontanum and terminal portion of the ejaculatory ducts was found with practically no microscopic evidences of seminal vesiculitis.

The material that was studied fell into the following groups:

1. Specimens which showed active gross suppurative lesions of the prostate and the periprostatic and vesicular regions.

2. Specimens which showed gross manifestations of active, acute or subacute inflammation of the urethra and the bladder neck, with indefinite gross evidences of prostatic or seminal vesicular inflammation.

3. Specimens which showed cicatricial changes of the vesical neck and posterior urethra, with patent dilated prostatic ducts, cribriform deformity of the prostatic urethra and distortion of the verumontanum. Gross evidences of vesicular induration and infiltration were indefinite and difficult to interpret.

4. Specimens which showed little change in the posterior urethra, with chronic inflammatory lesions of the upper urinary tract.

In the first group showing gross suppuration of the prostate and the periprostatic and vesicular regions, the microscopic picture was very striking. The mucosa and submucosa of the posterior urethra and vesical neck showed very marked exudative infiltration with polymorphonuclear leukocytes and plasma cells. The prostate showed marked intra-acinous and periacinous cellular exudation. Several large destructive suppurative foci were found, surrounded by areas of young fibrous tissue containing many newly formed blood vessels with marked perivascular cellular accumulations (fig. 1). Within the lumen of the ejaculatory ducts pus, plasma and desquamated epithelial cells were found, and their walls in the prostatic portion showed definite perivascular infiltration about numerous engorged blood vessels (fig. 2). Destructive suppurative involvement of the prostate was not sufficiently close to give more marked infiltrative involvement of the ejaculatory duct walls.

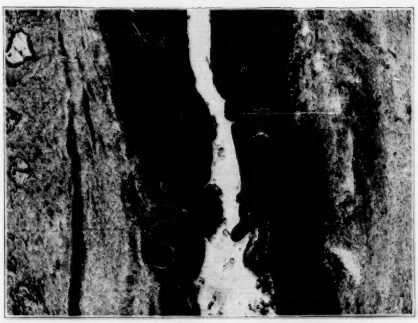

Fig. 4.—A higher magnification through the midportion of the ejaculatory duct shown in figure 3, showing marked submucosal infiltration with polymorphonuclear leukocytes and plasma cells. Blood vessels in the wall are engorged with marked perivascular infiltration. The lumen contains exfoliated epithelium and inflammatory cellular exudate.

The seminal vesicles in this group showed high grade perivesicular and vesicular infiltration by polymorphonuclear leukocytes and plasma cells, with marked perivascular cellular exudation about numerous vessels in the perivesicular tissues and muscularis. The lumen showed numerous desquamated epithelial cells mixed

with many pus and plasma cells. Submucosal cellular infiltration was present but not so definite.

In the second group showing active acute or subacute inflammation of the urethra and the bladder neck, with indefinite gross evidences of prostatic or seminal vesicular inflammation, the following microscopic pictures were presented: The submucosa of the entire posterior urethra was densely infiltrated with

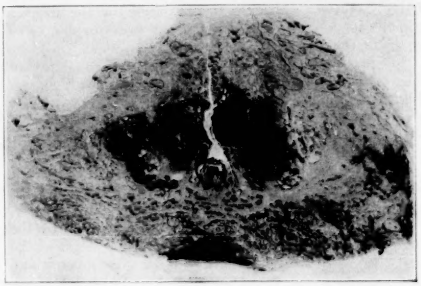

Fig. 5.—Large transverse section (low magnification) through the region of the verumontanum in a specimen demonstrating low grade chronic posterior urethritis and prostatitis. Note fibroma of the urethral wall encroaching into the lumen.

inflammatory cellular exudate (fig. 3). Marked intraacinous and periacinous cellular exudation was noted throughout the prostate, associated with perivascular round cell accumulations in the stroma. The verumontanum showed similar changes in its submucosa and glandular elements. The ejaculatory duct revealed marked cellular infiltration of the submucosa and muscle wall with exudation of polymorphonuclear leukocytes and plasma cells into its lumen (fig. 4). The seminal vesicle displayed corresponding inflammatory involvement of the lumen, mucosa and submucosa with less marked infiltrative changes in the vesicle muscularis. The picture presented was typically that of adnexal complication of posterior urethritis occurring by surface extension and without destructive suppurative involvement of any of the structures.

In the third group, numerous specimens were studied which showed cicatricial changes of the vesical neck and posterior urethra, occasionally with cribriform deformity, dilated patent prostatic ducts and distortion of the verumontanum. In these specimens the diagnosis of prostatitis was practically always verified on microscopic examination. A limited but definite proportion showed chronic inflammatory changes in some portion of the ejaculatory duct. In the less marked cases usually accompanied by mild chronic posterior urethral inflammation and low grade prostatitis the changes were frequently limited to the juxta-urethral portion of the ejaculatory duct (fig. 5). These changes consisted of engorgement of blood vessels with perivascular round cell infiltration, moderate diffuse periacinous and intraacinous cellular exudation of the glands of the verumontanum (fig. 6). Desquamation of the epithelium of the ejaculatory duct with slight submucosal fibrous thickening was also seen. These changes became less marked as the seminal vesicle was approached, which frequently showed no infiltration of the wall and scarcely any mucosal or submucosal change.

In the more marked cases, fibrotic changes were found in the submucosa of the urethra and vesical neck. The verumontanum in these specimens showed definite acinous distortion and cystic dilatation with intraglandular and periglandular round cell infiltration. Increased congestion, perivascular round cell accumulations and deposition of fibrous tissue were noted in this structure. The ejaculatory duct in its juxta-urethral portion often showed numerous blood vessels in the wall, round cell infiltration and newly formed fibrous tissue (figs. 7 and 8). Desquamation of the epithelium with fibrous thickening of the submucosa was also noted in this structure. The duct of the seminal vesicle sometimes showed numerous engorged blood vessels with a slight amount of perivascular round cell infiltration. Elsewhere the vesicle wall displayed little evidence of chronic infiltrative inflammation. In some cases numerous round cells, plasma cells and exfoliated epithelium filled the lumen and recesses between the mucosal folds of the seminal vesicle, always with similar exudative products in the lumen of the ejaculatory ducts (fig. 9).

In several specimens with inflammation of the upper urinary tract, low grade inflammatory changes were found in the submucosa of the urethra and in the verumontanum. The ejaculatory ducts were but slightly changed and the vesicles not at all.

COMMENT

Of the eighty-four selected specimens, sixty-six showed microscopic evidence of prostatitis, sixty-two cases being chronic and four acute or subacute; concomitant microscopic changes were found in the posterior vesical neck region in all but two, corresponding in stage and degree with the conditions in the adjacent prostate. Of the sixty-six specimens showing micro-

Fig. 6.—Higher magnification of verumontanum seen in figure 5. Submucosal round cell infiltration of ejaculatory ducts and utricle, with similar infiltration about the glands and vessels, indicates low grade inflammatory involvement of this region. The prostate shows low grade chronic inflammation, while the deeper portion of the ejaculatory ducts and seminal vesicles does not show any change.

scopic prostatitis, forty-nine showed a greater or a lesser degree of inflammation of the ejaculatory ducts. Of the forty-nine specimens showing inflammation of the ejaculatory duct, three were found with no seminal vesiculitis, thirty with slight indefinite chronic catarrhal seminal vesiculitis, and sixteen with marked chronic,

subacute and acute seminal vesiculitis. Of the sixteen specimens showing marked seminal vesiculitis, only four showed definite inflammatory infiltration of the seminal vesicle wall, one presenting prostatic abscess, one periprostatic abscess, and two marked chronic catarrhal seminal vesiculitis; three specimens demonstrated microscopic evidence of perivesiculitis, one presenting chronic catarrhal seminal vesiculitis and two subacute purulent vesiculitis with prostatic and periprostatic

Fig. 7.—Large sagittal section of the posterior urethra and vesical neck floor in a specimen displaying chronic prostatitis and inflammation of the verumontanum, ejaculatory duct and seminal vesicle.

abscess. No marked seminal vesiculitis was seen without corresponding inflammation of the ejaculatory duct.

On the basis of the microscopic studies made, it is possible to state definitely that inflammatory infiltrations occur in the walls of the seminal vesicles and ejaculatory ducts. It is also obvious that intermittent congestive obstruction of the latter must occur in a manner similar to that found in other epithelial-lined ducts with pathologically narrowed lumens. The lumen can easily become occluded temporarily by inflammatory débris arising in the seminal vesicle or in the ejaculatory duct itself.

Although the foregoing conclusions can be made, our studies do not show that such chronic infiltrative changes occur frequently in the muscularis of the seminal vesicles. Only in the presence of active, destructive, suppurative adnexal inflammation was marked perivesicular inflammation found. Such cases showed corresponding changes in the wall of the vesicle, and the lumen participated in the active surface inflammation in the urethra and ejaculatory ducts. The changes were sufficient to interfere with normal functional activity. Similarly, the ejaculatory ducts, in these cases, showed sufficient active infiltrative inflammation to permit of intermittent obstruction, either because of congestive changes or because of occlusion by inflammatory débris. Permanent occlusion of the ducts, due to subsequent scarring, seemed to be a remote possibility.

However, studies of the rather frequent ordinary forms of chronic posterior urethritis led to the conclusion that the aforementioned reaction is quite exceptional.

In the great preponderance of cases in which inflammatory changes were found in the seminal vesicles, associated with gross observations of posterior urethral and vesical neck cicatrization and low grade prostatitis, the microscopic picture was entirely different. Marked changes in the vesicle wall and perivesicular region were usually absent, and superficial changes alone were noted in the submucosa, mucosa and lumen. When definite superficial inflammation was noted in the vesicles, without infiltration of the wall, corresponding superficial changes were noted in the ejaculatory ducts in all the specimens. In a limited number of these cases mild inflammatory changes were noted in the ejaculatory duct walls, consisting of round cell infiltration and in a few instances scar formation. In some specimens the juxta-urethral portion of the ejaculatory duct showed chronic inflammatory infiltration diminishing in severity as the seminal vesicle, which was apparently normal, was approached.

It seems probable that the ordinary mild forms of seminal vesiculitis, occurring by surface and lymphatic extension, fail to involve the vesicle wall with any marked infiltrative reaction. Similar to that of any epithelial-lined organ, in the absence of glandular invaginations, the inflammatory reaction tends to remain superficial or catarrhal in nature. The poor drainage afforded the vesicles by the narrowed ejaculatory ducts and the folded arrangement of the mucosa are factors which tend to produce chronicity. But even under these circumstances the muscle walls seem to be subjected to little injury in most instances.

The ejaculatory ducts, on the other hand, are subjected to different influences. Being situated close to the urethra and being intimately surrounded by a gland which is very prone to chronic infection, the ejaculatory duct should show a higher rate of deep seated cicatrization and round cell infiltration than would the seminal vesicles. In addition, the terminal juxta-urethral portion is intimately related with glandular structures, some of which communicate with the duct directly. The verumontanum from its situation and structure frequently undergoes marked inflammatory change, and it is evident that the terminal portion of the ejaculatory duct must be more susceptible to infiltrative changes in this region. Our studies have demonstrated this to be true. In many instances, chronic ejaculatory duct

Fig. 8.—High magnification of the ejaculatory duct in the region of the verumontanum shown in figure 7. Chronically inflamed cystic glands, intra-acinous and periacinous cellular exudation as well as perivascular round cell infiltration are noted. The stroma adjacent to the ejaculatory duct shows numerous blood vessels with perivascular round cells and an increase in newly formed fibrous tissue. The mucosa and submucosa show round cell infiltration with desquamation of epithelial cells, round cells and plasma cells in the lumen.

inflammation was found without corresponding changes in the deeper coats of the vesicles. The arrangement of blood vessels in the verumontanum and in the ejaculatory ducts demonstrates the ability of these structures to become engorged. Irritative congestion superimposed on infiltrative lesions, which in themselves may

not be obstructive, can produce intermittent occlusion of the lumen of the duct.

Our studies make it evident to us that the ejaculatory ducts are always involved in posterior urethral inflammation. In the greater number the infection is mild and juxta-urethral, and of these only a relatively small percentage cause sufficient involvement to eventuate in chronic infiltrative changes of the terminal portion of the duct. In cases in which, because of various factors, infection of the adnexa becomes more widespread and chronic, catarrhal inflammation of the ejaculatory ducts and seminal vesicles will be found in conjunction with a diffuse follicular prostatitis. In a definite proportion of these cases chronic inflammatory changes of the wall of the juxta-urethral portion of the ejaculatory duct (associated with productive inflammation of the verumontanum) will occur eventually, with diminishing tendency toward such involvement as the seminal vesicles are approached.

The seminal vesicles, in the greatest number of chronic adnexal inflammations, show superficial inflammatory changes of a chronic type, with little evidence of infiltration of the walls. This pathologic observation should not be interpreted to mean that chronic seminal vesicular infection is uncommon but merely that marked

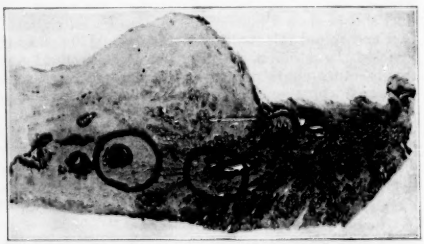

Fig. 9.—Sagittal section through the posterior aspect of the entire vesical neck and posterior urethral region. A case showing chronic posterior urethritis, prostatitis, seminal vesiculitis and inflammation of the ejaculatory duct.

inflammatory response in the wall and perivesicular tissue does not occur with the ordinary types of chronic vesiculitis. Such marked involvement is seen only in conjunction with overwhelming regional inflammation of the destructive suppurative type.

Clinical experience accepts the conception that spread of infection from the posterior urethra occurs by way of mucosal continuity and lymphatic invasion. The lymphatics of the posterior urethra are known to drain with those of the prostate and seminal vesicle to the hypogastric and external iliac glands. Active infection and inflammation of these structures may result in acute lymphangitis and regional lymphadenitis, with or without local inflammatory infiltration of the affected region. With the subsidence of the focal infection, lymphangitis becomes less marked, although the lymph nodes remain enlarged for a considerable period. Numerous specimens are noted of frank cicatricial posterior urethritis and chronic quiescent prostatitis, with or without inflammation of the ejaculatory ducts and the seminal vesicles, in which the regional lymph nodes were enlarged but with no perivesicular fibrosis. It is conceded that these necropsy observations do not preclude the possibility of the previous incidence of temporary infiltration and inflammatory thickening of the periprostatic and perivesicular regions, with complete or almost complete absorption of exudate and a return to normal with a minimum degree of postinflammatory fibrosis. Here again the rich lymphatic and blood supply, which would seem to predispose to regional spread to the perivesicular regions, with the deposition of chronic inflammatory exudate may really promote rapid absorption of inflammatory products in this region.

On the other hand, marked destructive suppurative involvement of the prostate and seminal vesicles causes marked exudative response of the entire region, and with marked suppurative destruction of tissue, reparative processes should result in fibrosis of the vesicles and perivesicular regions. Even in such cases absorption of a great proportion of the inflammatory mass occurs. These considerations may explain the fact that necropsy studies fail to encounter vesiculitis and perivesiculitis with the same frequency that would be expected from clinical impressions alone.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MC CARTHY AND RITTER AND DRS. HYAMS, KRAMER AND MC CARTHY

DR. J. SYDNEY RITTER, New York: I will show a slide which emphasizes the fact that one cannot have pathologic changes in the prostate without some changes in the ejaculatory ducts. One slide demonstrates a condition which I think Drs. Hyams, Kramer and McCarthy failed to mention; that is, infection involving the utricle. Now that pathologic changes are known to exist in the seminal vesicles and ejaculatory ducts, the question of therapy arises. What is one going to do to effect a cure? Some time ago seminal vesiculectomy was advocated, and many have attempted it, with such poor results that it has practically disappeared from therapeutic surgical procedure. I think this is largely due to the fact that the diagnosis has been based on a rectal examination with the uncertain finger and on the more uncertain subjective symptoms of the patient. These results are due to the fact that no attention is paid to the ejaculatory ducts, and drainage through them is not favored. Vasotomy is objected to because that means a surgical procedure with no attention paid to the ejaculatory duct. The procedure advocated today by Drs. McCarthy and Ritter should be a universal practice because vesiculitis can be diagnosed scientifically. One should note the condition of the ejaculatory duct, medicate the vas deferens, dilate the duct and pave the way for cure.

DR. A. E. BOTHE, Philadelphia: One needs only to have worked with desiccated seminal vesicle specimens to know what difficulties Drs. Hyams, Kramer and McCarthy must have encountered in collecting the interesting group shown in the scientific exhibit. Dr. Coulbeck and I have been working along the same lines, and although we have not studied as many specimens, we have done enough to realize the difficulties that one encounters in this work. It is the anatomic relation of the vasa deferentia, the ducts of the seminal vesicles and the ejaculatory ducts to which I wish to make especial reference. Before preparing our specimens for desiccation, we injected sodium iodide through the vasa deferentia and took roentgenograms. These pictures consistently showed that the ejaculatory duct is a continuation of the duct of the seminal vesicle. They also showed that the vasa deferentia joined the seminal vesicle duct at various angles, ranging from the extreme acute type up to an almost complete right angle. The desiccated specimens also gave evidence of this relation. In another group of specimens we made a number of serial sections through the region of the ducts. These showed definitely that the seminal vesicle ducts are larger than the vasa deferentia and that the latter join the duct of the seminal vesicle, which becomes the ejaculatory duct. If one considers this anatomic relation of the ducts of the seminal vesicle, vasa deferentia and ejaculatory ducts, it is easy to see the marked influence which periductal inflammatory changes may have in causing obstruction which may play an important part in sterility, as well as other symptoms.

DR. J. DELLINGER BARNEY, Boston: Fifteen or eighteen years ago, when many seminal vesicles were being taken out because of disease, I injected many of them, and the roentgenogram showed almost the identical pictures that Drs. McCarthy and Ritter have so well demonstrated. After a good deal of experience I got so that I could tell before taking out the seminal vesicle whether it was or was not the seat of disease. It showed the changes in the lumen and in the conformation. I also verified the work of Picker many years ago, in which he was able to divide the contour of the seminal vesicle into three or four portions. I think that with some experiences one can tell whether the seminal vesicle is or is not diseased before taking it out. I wish to know how far into the ejaculatory duct one can pass the catheter.

DR. J. A. HYAMS, New York: Because of the brief time allotted, we were able to discuss only eighty-four specimens. In the study of celloidin casts, demonstrated in detail in the exhibit, an additional forty series of microscopic sections of the uninjected opposite seminal vesicle were examined. Although these sections corresponded in part as to histopathologic observations, the amount of pathologic change was greater in the larger sections, emphasizing the importance of large sagittal and transverse sections through the seminal vesicles and contiguous structures. Picker injected seminal vesicles with bismuth paste, took roentgenograms and dissected the vesicular mass. He demonstrated the structure of the seminal vesicle. Pallin made casts to study the embryologic structure, but his technic was not available. Such work does not suffice for our present needs. Therefore, not only casts but roentgenograms, microscopic examination of the secretion, and complete gross and histopathologic studies were made in order to determine the pathologic changes present in these structures. Histologic investigation of isolated structures falls short of the desired result, and only by complete pathologic studies such as we have made, combined with parallel clinical and instrumental observations as presented by Drs. McCarthy and Ritter today, can a proper conception of the pathologic changes be derived. Impressions of abnormality in the seminal vesicles as shown by digital palpation or ordinary methods of examination are necessarily incomplete. The complexity of the vesicular mass is such that no two vesicles can be said to be the same. Variations occur on the two sides in the same individual. Furthermore, a fairly definite relationship has been found to exist between inflammatory change at the posterior urethra, vesical neck and adnexa. Vesiculitis presupposes urethral involvement. With increasing complexity of the seminal vesicle there is greater incidence of infection, and drainage becomes more difficult. Evacuation of secretion is further impeded by superimposition of abnormalities. The persistence of infection is dependent on the complexity of the structures rather than on the type of virulence of the infecting agent. In our dissection of 500 bodies, perivesiculitis and terminal fibrosis was found in only six cases. Thorough methods of clinical investigation by those individuals who by their training and experience are particularly well qualified in this field, coordinated with more extensive studies along broad pathologic lines, will eventually lead to greater diagnostic accuracy and improved methods of treatment of diseases of these structures.

DR. J. F. MCCARTHY, New York: Emphasis is laid on the proximity of the two ducts, to call attention to the great care that must be exercised in these injections. The ducts are separated by so thin a membrane that it is possible to inject on one side and find a vesiculogram of the other. The paper contains all the material that we did not have time to elaborate. Dr. Barney has asked how far the catheter may be introduced. From 2 to 2.5 cm. is sufficient.

The Background of Personality.—The most fundamental characteristic of normal human personality is unity, wholeness, integration. This integration appears in many ways. It is shown in the tropisms of plants and animals and in concentration of attention to the child and the adult. The general function of the nervous system is integration. Recent studies of the brain put emphasis also on the whole rather than any special part.—Burnham, W. H.: The Wholesome Personality, New York, D. Appleton & Co., 1932.

THE RELATION OF CONGENITAL DEFORMITIES OF THE HAND TO CERVICAL RIBS*

ROBERT V. FUNSTON, M.D.
DETROIT

Several months ago a woman, aged 50, and her daughter, aged 9, were examined in the orthopedic clinic at Harper Hospital. The mother had a bilateral absence of the radius with club hand deformity and rudimentary thumbs. The daughter had an exactly similar deformity of the right hand. The left hand of

Fig. 1 (case 1).—Right and left hands, showing rudimentary radii.

the daughter, however, had no thumb and there was a synosteosis between the radius and the ulna just distal to the elbow joint.

During the examination, cervical ribs were palpated in the neck of the mother, and roentgenograms revealed well developed cervical ribs in both mother and daughter, as shown in figure 2.

The finding was so striking that two patients with club hand previously seen were brought back for roentgen examination, and both were found to have cervical ribs.

Fig. 2 (case 1).—Cervical spine showing large hornlike cervical ribs.

A baby about 3 months old was recently seen for the first time in the clinic and showed also the presence of cervical ribs.

Whether the presence of cervical ribs in congenital absence of the radius in these five cases is coincidental or a consistent finding, I am anxious to determine.

In no instance in this series was there a complete absence of the radius, but in five instances in the six club hands present there was only a small proximal portion of the radius to be seen. In the other case, the radius, although rudimentary, articulated with the carpal bones.

In reviewing the literature on the subject, including textbooks, I do not find mention of any association of the two deformities.

Pasquali,[1] in 1880, reported a typical case of bilateral

* Read before the Section on Orthopedic Surgery at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. Pasquali: Un bambino mancante di ambedue le ossa del radio (Case of Bilateral Absence of the Radius in a Child), Boll. d. Accad. med. di Roma **6**: 6, 1880.

absence of the radius in a child. There was, in addition, absence of both first metacarpal bones and of certain carpal bones. The thumbs consisted of two phalanges and were attached to the hand by a minute cutaneous peduncle. The hands, which were articulated directly with the ulna, were found in a position of

Fig. 3 (case 2).—Right and left forearm, showing on the left rudimentary radius with club hand; on the right, synosteosis between radius and ulna in the upper third.

such marked adduction that the external edge of the hand formed an approximate right angle with the corresponding margin of the forearm. The four fingers of the hand showed clinodactyly with moderate flexion deformity.

Cuff,[2] in 1896, reported an interesting case of the absence of the radii in both arms which developed after the age of 17, as a result of congenital syphilis. Congenital syphilis has been mentioned in several instances as a possible predisposing cause of the deformity.

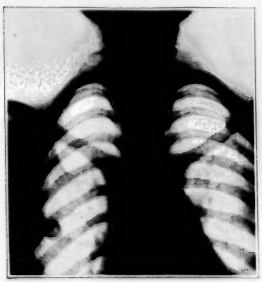

Fig. 4 (case 2).—Cervical spine, showing large cervical ribs.

Reisz,[3] in 1904, presented a typical case of bilateral congenital absence of the radius in a woman, aged 20.

Illyes,[4] in 1907, presented a case in an infant.

Roschke,[5] in 1912, drew attention to the fact that the upper arm and scapular regions appeared normal in a case presented by him. He described in detail the muscular action exhibited in the use of the hands.

Garrido Lestache,[6] in 1918, presented a typical case of "radiopalmar club hand" in an infant, aged 9 days.

Infante [7] draws attention to the fact that in his patient, a little girl, there was no involvement of any other part of the body.

Oidtmann [8] presented a case of a boy, aged 7 months, on whom he operated, bifurcating the lower end of the ulna and attaching the scarified carpus into its normal position. Roentgenograms taken several months later showed that the bifurcated extremities of the ulna had thickened and enclosed the carpus.

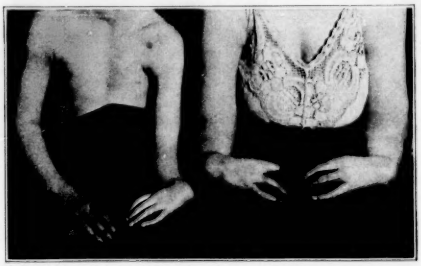

Fig. 5 (cases 1 and 2).—Mother and daughter, showing typical deformities.

Spears,[9] describes a child, aged 20 months, showing "considerable shortening of both forearms with adduction of both wrists, giving the hands the appearance of feet." He applied plaster of paris to correct the deformity.

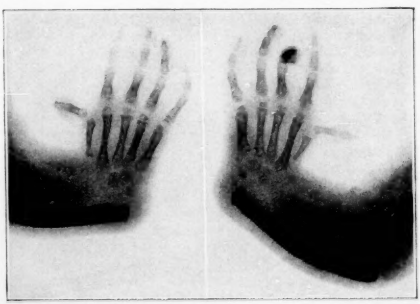

Fig. 6 (case 3).—Club hand with rudimentary radii and first metacarpals.

Alonzo,[10] in 1925, reports three cases of congenital deformity of the forearm in adults, in which the radius

2. Cuff, A.: Absence of Radii, Clinical Sketches, London **3**: 41-42, 1896.
3. Reisz, O.: Ketoldalu veleszuletett Radiushiany flenott egyenen (Bilateral Congenital Absence of the Radius), Gyógyászat, Budapest **44**: 727, 1904.
4. Illyes, G.: Congenital Absence of the Radius, Orvosi hetil. **51**: 36, 1907.
5. Roschke, E.: A Case of Bilateral Absence of the Radius, Inaug.-Diss., Munich, 1912.
6. Garrido Lestache: Un case de ausencia congenita bilateral y completa del radio y de todos los huesos del carpo (A Case of Complete Bilateral Congenital Absence of the Radius and of All the Carpal Bones), Pediatria españ. **7**: 91, 1918.
7. Infante, C.: Un Caso di assenza congenita del radio bilaterale (A Case of Bilateral Congenital Absence of the Radius), Atti del I. Congresso italiano di radiologia medica **1**: 154, 1913.
8. Oidtmann, A.: Result of Operative Treatment of Complete Absence of the Radius, Nederl. tijdschr. v. geneesk. **1**: 2172, 1917.
9. Spears, L. P.: Bilateral Congenital Absence of Radius, Kentucky M. J. **21**: 407 (Aug.) 1923.
10. Alonzo, P.: Three Cases of Defective Forearm, Riforma med. **41**: 487 (May 25) 1925.

was absent in two cases; the ulna, in one instance. He states that among 1,444 cases of deformity, Hoffa noted the absence of the radius in one, while Dollinger did not note it once among 859 cases. In Raboud and Hovelacque's statistics, in 1924, absence of the fibula was noted in 268 cases, of the tibia in 122 cases, of the radius in 220 cases, and of the ulna in 71 cases. Ratsuji Kato's statistics included 253 cases of a defective radius. Amniotic constriction, intra-uterine fractures, ischemic phenomena and mental injury of the mother are considered, among others, as etiologic factors. In Alonzo's opinion, endocrine disturbances, especially of the pituitary, are responsible for congenital hemimelia.

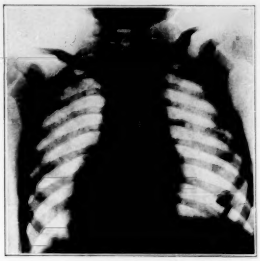

Fig. 7 (case 3).—Cervical spine showing cervical ribs.

Lewin,[11] in 1918, and Gaenslen,[12] in 1914, both presented a series of cases, but neither reported any abnormalities in the cervical spine.

The cases that are being presented in this paper are typical, except that in one case the radius was not as rudimentary as in the others. In all the cases, the thumb was rudimentary and was attached only by a cutaneous peduncle.

The presence of the condition in a mother and daughter strongly favors an hereditary basis. In no instance was there any history of syphilis and in all instances the Wassermann reaction was negative.

One striking fact was noted: that the difference in development of the arm, as far as length was concerned, in a comparison of the mother and daughter in this series, was very slight. The length of the ulna as developed in the mother was 5½ inches (14 cm.). As developed in the daughter at the age of 9, 4½ inches (11.5 cm.). This fact makes it seem an advantage to correct surgically the deformity in these cases early, so as to obtain the maximum muscular development and dexterity of the hand, rather than to wait for the osseous growth.

Fig. 8 (case 4).—Rudimentary radius and thumb.

11. Lewin, Philip: Congenital Absence of Bones of the Extremities, Am. J. Roentgenol. **4**: 431 (Sept.) 1917.
12. Gaenslen, F. J.: Congenital Defects of Tibia and Fibula, Am. J. Orthop. Surg. **12**: 453-481, 1914-1915.

Three of the patients herein mentioned have received treatment. The patient who had a complete but undeveloped radius was operated on, and a portion of the ulna was removed in the middle third. The deformity was then corrected and has remained so. The rudimentary thumb was amputated and a thumb was devised from the index finger by making a cleft between the metacarpals and rotating the finger by osteotomy. A resection of the distal interphalangeal joint, with removal of part of the middle phalanx later, improved stability. The end-result was a satisfactory three fingered hand with a thumb, which functioned almost normally.

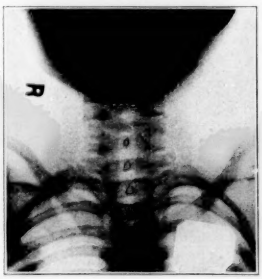

Fig. 9 (case 4).—Cervical spine showing cervical ribs.

The operation performed in the second case was the correction of the deformity and arthrodesis of the ulna to the carpus. This was done by Dr. Frank Curtis at the Children's Hospital and resulted in marked improvement in the function of the hand.

The third patient, a baby seen a few weeks after birth, was treated by a plaster-of-paris dressing until overcorrection was obtained. A splint was then applied to maintain correction until sufficient growth had occurred to justify operative procedure.

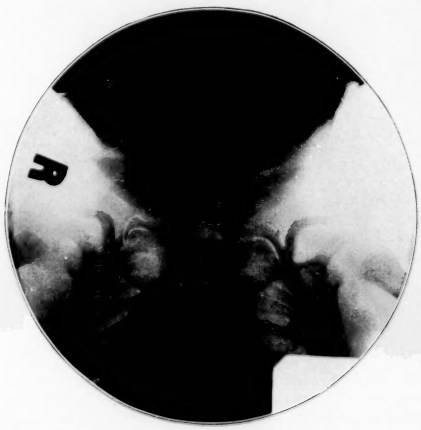

Fig. 10 (case 5).—Cervical spine showing cervical ribs.

The mother and the daughter refuse treatment.

Two additional cases have been added to this series by Drs. Robert Schrock of Omaha and F. J. Gaenslen of Milwaukee, showing club hand deformities and cervical ribs.

1551 Woodward Avenue.

ABSTRACT OF DISCUSSION

DR. PHILIP LEWIN, Chicago: In a series of cases reported in 1918 I failed to have roentgenograms taken of the cervical spine. I shall try to get some of the patients to come back for that examination. Dr. Funston is emphasizing the importance of this seventh cervical region and some day the proper importance will be attached to it. It took many years for the fifth lumbar vertebra to obtain its due recognition. I should like to ask Dr. Funston at what age he expects cervical ribs to show. I reported one instance of cervical rib in a case of brachial birth palsy, associated with osteochondritis of the upper end of the humerus in a girl aged 6 years.

DR. F. J. GAENSLEN, Milwaukee: The observation of the peculiar broadening of the neck of the mother of one of the patients apparently led to the search and to the finding of further cases in which congenital deformities of the hand and cervical rib were associated. The fact that five or six such cases were found would seem to indicate that this was not a coincidence. I had hoped that Dr. Funston would set up a hypothesis for us to shoot at, as it seems easier in this case to disagree with any of the theories suggesting themselves than it is to offer one that will stand scrutiny. I certainly have none to offer.

DR. ROBERT V. FUNSTON, Detroit: In answer to Dr. Lewin's question, the earliest case was in a child aged 8 weeks when the roentgenogram was taken. The cervical ribs did not show up clearly. They do not show up so clearly in the younger children as they do later on. I should like to say also that Dr. Schrock of Omaha sent me a photograph and roentgenogram of a child whom he saw, and the child showed a definite cervical rib. Dr. Gaenslen also has reported a case. The child was very young. The roentgenograms seem to show a cervical rib, but I wouldn't be willing to say, as they are not very clear.

IMMEDIATE CECOSTOMY AND CONSTANT LAVAGE IN MERCURIC CHLORIDE POISONING*

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CLEVELAND

An analysis of 163 cases of mercuric chloride poisoning in the Mount Sinai Hospital of Cleveland, both from the clinical and particularly from the pathologic point of view, has demonstrated the importance of gangrenous colitis in the course of mercury poisoning.

It has been the general conception in the past that most patients with mercury poisoning die of renal insufficiency. "Unless a fatal issue results early from shock or some other unusual occurrence, the patient [poisoned by mercury] virtually lives or dies by his kidneys."[1]

In the past five years, the number of patients (seventeen) with mercury poisoning coming to autopsy at Mount Sinai Hospital of Cleveland were found to fall into three groups (table 1): Group 1. Those dying within forty-eight hours of the ingestion of the poison in shock, following an extensive and severe gastritis, with marked hemorrhagic necrosis of the stomach wall. Group 2. Those dying from forty-eight hours to seven days after the ingestion with retention of nitrogenous substances following a severe necrotizing nephrosis. Group 3. Those dying from seven to twelve days after ingestion with an extensive and severe gengrenous colitis, the kidney lesion at this time showing evidence of healing.

The colonic lesion, therefore, is one of the three most important causes of death in mercuric chloride poisoning.[2] Therefore, measures to combat this serious involvement must of necessity assume an important

TABLE 1.—*Lesions of Mercury Poisoning*

	Duration		
	Within 24 Hours of Ingestion	From 48 Hours to 7 Days After Ingestion	From 7 to 12 Days After Ingestion
Number of cases	6	7	4
Principal lesion	Extensive severe gastritis (fig. 1)	Necrotizing nephrosis (figs. 2, 3 and 4)	Extensive, severe gangrenous colitis (fig. 5)
Other lesions	Shock; alteration of blood with increased fluidity and inability to clot	Retention of nitrogenous substances; generalized parenchymatous degeneration; gastritis of variable severity	Gangrenous stomatitis; healing nephrosis; healing gastritis

rôle in the treatment of mercuric chloride poisoning, and we have found immediate cecostomy and constant colonic lavage to be the most effective.

The idea of cecostomy is not new. Perhaps the first to try cecostomy early in mercury poisoning was Anderson, who in 1915 reported recovery of a girl, aged 19 years, in whom cecostomy was done about fourteen hours after the ingestion of 10 grains (0.65 Gm.) of mercuric chloride. The colon was continuously lavaged with water to which various agents were added.

We also have employed it in the past, but always late and as a last resort. However, the gangrenous lesions in the colon were by then well advanced and the gangrenous process frequently extended to the operative wound and abdominal wall. This added greatly to the suffering of the patient and to the difficulty of treatment, without modifying an invariably fatal outcome. Hence the procedure was abandoned.

During the past five years we became so thoroughly impressed with the colonic lesions at the postmortem table that we again resorted to cecostomy and constant colonic lavage as soon as symptoms of colitis appeared, in the hope of combating it, but with equally disappointing results. Then the idea of performing cecostomy as soon as mercury poisoning could be established occurred to us and has been employed with encouraging results.

Our present plan is to establish a diagnosis promptly in all patients admitted with mercury poisoning, so that immediate cecostomy and constant lavage may be done, provided the patient is not in shock. We have found the electrolytic method of Booth and Schreiber,[3] which

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* From the Departments of Medicine and Pathology, Mount Sinai Hospital.

* Read before the Section on Practice of Medicine at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

1. Doane, J. C., in Billings: George Blumer Edition of Forchheimer's Therapeusis of Internal Diseases **3**: 634, 1926.

2. Schuster, quoted by Welander, E.: Ann. de dermat. et syph., series 2, **7**: 412, 1886. Lambert, S. W., and Patterson, H. S.: Poisoning by Mercuric Chloride and Its Treatment, Arch. Int. Med. **16**: 865 (Nov.) 1915. Zeigler, W. H.: J. Lab. & Clin. Med. **10**: 259 (Jan.) 1925.

3. The electrolytic method of Booth and Schreiber (J. Am. Chem. Soc. **47**: 2625 (Nov.) 1925) is as follows: The current from an ordinary dry cell (about 1 volt) is allowed to flow through the specimen to be tested for five minutes, a platinum wire being used for an anode and a bright copper strip for a cathode. The mercury, if present, is deposited as a silvery metallic film on the copper. The method is delicate and reliable and does not require preliminary digestion. The sensitivity of the test may be increased by concentrating the specimen by evaporation. The method has been modified from that originally given by Booth and Schreiber, approximately 25 cc. of the specimen to be tested being used in a small evaporating dish instead of a few drops in a tissue culture slide as recommended by Booth and Schreiber, and also a strip of copper several millimeters in width for the cathode in place of a fine copper wire. The method is economical, dispensing with the use of large quantities of chemicals, and there are no disagreeable fumes.

can be performed in five minutes, the most satisfactory method for the prompt detection of mercury. The older methods (Vogel and Lee) were more difficult and it often took several days before reliable information was obtained, and thus the most opportune time for treatment was lost.

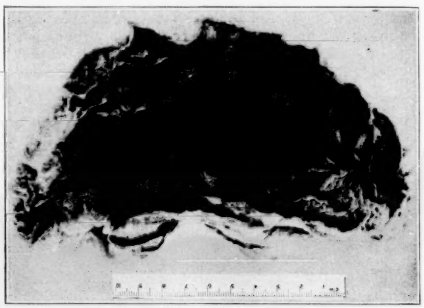

Fig. 1.—Acute hemorrhagic and gangrenous gastritis.

Cecostomy was performed in nine cases. In three, cecostomy was done on the fourth day after ingestion. All the patients died. Two patients were operated on the third day after ingestion. Both died. One patient was operated on within twenty-four hours after admission but fifty-six hours after ingestion of the poison. This patient died in shock. Three patients were operated on fifteen, nineteen and nineteen and a half hours, respectively, after ingestion. All three recovered.

TABLE 2.—*Chart of Operations*

Total	Died	Necropsy	Recovered
9	6	3	3
No. of Patients	Operated On	Result	
1	2d day after ingestion	Died on the day of operation	
1	4th day after ingestion	Died on the day of operation	
1	3d day after ingestion	Died day after operation	
1	4th day after ingestion	Died second day after operation	
1	3d day after ingestion	Died third day after operation	
1	4th day after ingestion	Died ninth day after operation	
1	15 hours after ingestion	Recovered	
1	19 hours after ingestion	Recovered	
1	19½ hours after ingestion	Recovered	

Table 2 seems to indicate that the earlier cecostomy is performed, the better the prognosis.

FATAL CASES

CASE 1.—S. G. took six tablets of mercuric chloride, August 10. The patient was admitted to the hospital, August 14, and a cecostomy was performed the same day. The patient died the following day. The observations at autopsy were: necrotizing nephrosis; gastritis with ulceration, and congestion of the colon. It should be noted that cecostomy was done in this case on the day of admission but four days after ingestion of the mercury.

CASE 2.—L. J. took ten tablets of mercuric chloride. The patient was admitted to the hospital, June 17. A cecostomy was performed, June 21, and the patient died, June 23. The observations at autopsy were: marked necrotizing nephrosis; hemorrhagic and gangrenous gastritis, and gangrenous colitis. The cecostomy in this case was done four days after ingestion of the mercury.

CASE 3.—C. N. took two tablets of mercuric chloride and was admitted to the hospital in shock, November 16. Cecostomy was done, November 17, twenty-four hours after ingestion of the mercury. The patient died in shock. The observations at autopsy were: necrotizing nephrosis, and hemorrhagic and gangrenous gastritis. The colon was normal. Blood for an examination of the chemistry of the blood was not obtained.

CASES IN WHICH THE PATIENTS RECOVERED

CASE 4.—B. L. had taken nine tablets of mercuric chloride at 5:30 p. m., January 8, and was admitted to the hospital at 6 o'clock that same day. Cecostomy was performed, January 9, at 12:12 p. m. (nineteen hours after ingestion). The patient was discharged, February 11.

CASE 5.—R. L. took several tablets of mercuric chloride. The patient was admitted to the hospital, September 2, at 4:45 p. m. Cecostomy was performed, September 3, at 12:20 p. m. (nineteen and one-half hours after ingestion of the mercury). The patient was discharged, September 18.

CASE 6.—C. C. took one tablet of mercuric chloride, December 25, at 8:20 p. m. and was admitted to the hospital at 9:10. Cecostomy was performed, December 26, at 11:20 a. m. (fifteen hours after ingestion). The patient was discharged, January 10.

We now feel that, when cecostomy is done, if the gastric flushing is positive and the colonic flushing negative for mercury the prognosis is better than when the colonic flushing is also positive.

In many cases in which the diagnosis on admission was mercury poisoning, no mercury was recovered from the excreta. This may be explained by the fact that either no mercuric chloride was taken or the method of detection was not satisfactory. If these cases are included in statistics, it would materially bring down the mortality, and undue credit would be given to whatever plan of treatment was used. This would explain the

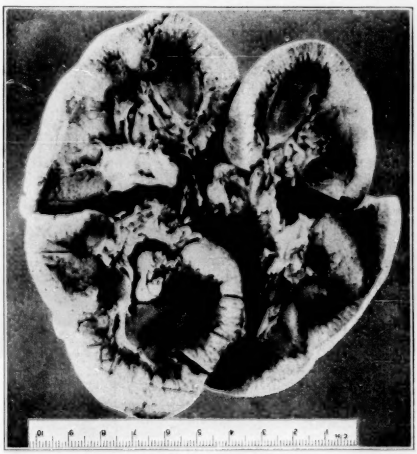

Fig. 2.—Necrotizing nephrosis.

discrepancy in the mortality rate as reported in the literature.[4]

In this series of 163 cases, 57 were proved; that is, mercury was recovered from the excreta; 106 were

4. Doane (footnote 1). Lambert and Patterson (footnote 2). Schuster (footnote 2). Zeigler (footnote 2). Anderson, J. H.: Surg. Gynec. Obst. **20:** 350, 1915. Weiss, H. B.: Mercuric Chloride Poisoning, Arch. Int. Med. **33:** 224 (Feb.) 1924; Ohio State M. J. **13:** 595 (Sept.) 1917; The Principles of Treatment in Mercuric Chloride Poisoning, J. A. M. A. **71:** 1045 (Sept. 28) 1918. Goldblatt, Samuel: Am. J. M. Sc. **176:** 645 (Nov.) 1928.

doubtful. Many of the doubtful cases were the earlier ones of this series, and many of them were clinically mercury poisoning but no mercury was recovered from the excreta.

The severity of the poisoning depends on a number of factors: (1) the amount of mercuric chloride taken; (2) whether the mercury is taken in tablet form

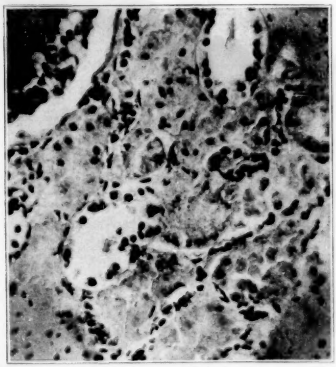

Fig. 3.—Early necrotizing nephrosis (mercury poisoning, fifty hours).

or in solution; (3) the condition of the stomach, i. e., whether empty or full (one tablet taken in solution on an empty stomach will do a great deal more damage than a larger dose on a full stomach, with the time factor for initiation of treatment the same); (4) whether vomiting occurs immediately, and (5) promptness with which treatment is instituted.

In 67 per cent of the fatal cases the patients died in the first forty-eight hours of shock. More than half of these (thirty-eight per cent) died in the first twenty-four hours (from shock). The next largest number died in the second twenty-four hours (29 per cent) of gangrenous necrosis of the stomach. At this stage, hemorrhagic and gangrenous necrosis of the stomach, cloudy swelling of the parenchymatous organs and beginning necrotizing nephrosis were noted. The colon showed congestion and edema. Two patients who died in two and one-half and three hours, respectively, showed marked alteration in the blood with increased fluidity and failure to clot. Platelet counts and clotting time were not determined. After forty-eight hours, death occurred in about even distribution as to time, up to thirteen days. Beginning with the third day, the intensity of the stomach involvement decreased, and, as early as the sixth day, advanced gangrenous colitis was present.

TABLE 3.—*Analysis of One Hundred and Sixty-Three Cases*

	No. of Cases	Male	Female	Recovered	Died	Autopsy	Operated On
Proved or positive	57	14	43	33	24	17	9 (6 died) (3 post) (3 recovered)
Doubtful	106	22	84	102	4	0	0

TABLE 4.—*Mercury Obtained*

Stomach (Lavage and vomitus)	Colon (Irrigation)	Kidney (Urine)
33 cases	18 cases	13 cases

In 21 cases, mercury was obtained from the stomach only
In 3 cases, mercury was obtained from the urine only
In 5 cases, mercury was obtained from the stool only
In the other positive cases, mercury was obtained from more than one source

Kidney damage begins promptly. Seven cases of from forty-eight hours' to seven days' duration coming to autopsy showed principally a severe necrotizing nephrosis, which was present as early as three hours after ingestion and was well marked at the end of twenty-four hours. By the end of forty-eight hours,

TABLE 5.—*Duration of Life in Days in Fatal Cases*

	Duration												
	2 to 20 hr.	1	2	3	4	5	6	7	8	9	10	11	12	13
Number of cases.....	9	0	4	2	1	1	1	1	0	2	0	1	1	1

Total cases, 23; autopsies, 17

instances of nonprotein nitrogen of 148, 158, 230, 272 mg. per hundred cubic centimeters of whole blood, i. e., a severe kidney damage with marked retention, were noted. Evidence of healing of the renal lesions in the cases coming to autopsy was noted on the ninth day. Clinically, healing was manifested as early as the sixth day, as shown by the diminution of the nonprotein nitrogen. In some cases, advanced healing had taken place by the thirteenth day with return of the nonprotein nitrogen to normal.

ANURIA

We were under the impression that anuria occurs frequently, but in this series it occurred only in six cases. Three of these patients recovered and three died. In eight other patients who died of shock in the first twenty-four hours, no urine was obtained. In how many of these anuria might have persisted, had they

Fig. 4.—Healing necrotizing nephrosis (mercury poisoning, twelve days).

lived beyond the first twenty-four hours, we do not know.

That the kidney damage alone is not the determining cause of death is shown by instances of very severe kidney damage with nonprotein nitrogen retention at the end of forty-eight hours of 148, 158, 230, 272; yet they all recovered. On the other hand, at the end of the same period, some patients who had a nonprotein nitrogen of 170 (maximum) and less died at

the end of seven days, when the kidneys were already showing evidences of healing. The determining cause of death in the latter cases was found to be gangrenous colitis of considerable extent.

Gastro-Intestinal Tract: Stomatitis, pharyngitis, esophagitis and gastritis, varying in intensity are constantly present. Ulcerative gangrenous stomatitis was frequently observed in the late cases.

The chief condition referable to the gastro-intestinal tract that we wish to emphasize is the gangrenous colitis. It was present in seven of the cases coming to autopsy. The earliest it was noted in our pathologic material was fifty hours after the ingestion of mercury, when already well marked colitis was present. This

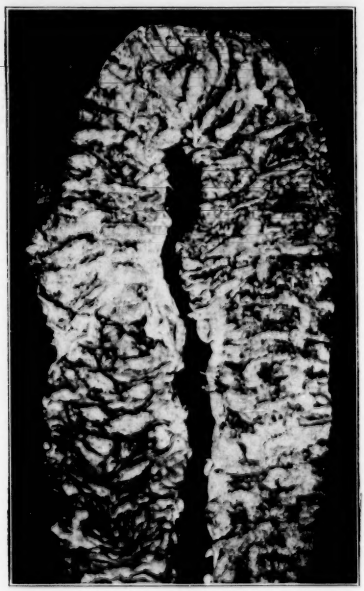

Fig. 5.—Gangrenous colitis.

patient had a necrotizing nephrosis which was the probable cause of death. In the remaining six cases, from six to twelve days (average nine) elapsed before gangrenous colitis was noted post mortem, in contradistinction to cases coming to autopsy from the second to the sixth day, when necrotizing nephrosis predominated as the cause of death. Two patients who had probable severe lesions in the colon as manifested by pain and diarrhea recovered spontaneously.

COMMENT

Kidney involvement is prompt in mercury poisoning. It begins in the first twenty-four hours after the ingestion. Gangrenous colitis appears later, from six to twelve days (average nine) after ingestion. If mercury damages the kidney early and severely so that it is unable to further the elimination of the poison, then the other channels are brought into play, chiefly the colon. The minimizing of the inevitable damage to the colon through constant lavage is reasonable and sound. The earlier this is instituted, the more effective it is in preventing this serious colonic involvement.

In this series it is evident that there were three principal causes of death: (1) shock and hemorrhage which came on promptly; (2) renal damage as early as three and one-half hours after the ingestion and reaching its maximum before the sixth day; (3) gangrenous colitis, from six to twelve days after ingestion, i. e., later than the renal damage. Pathologically, it reached its maximum by the ninth day. Those cases coming to autopsy between the sixth and the thirteenth day showed the most severe lesion to be gangrenous colitis with the kidneys already in a state of advanced healing.

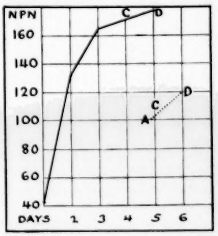

Fig. 6. — Nonprotein nitrogen in cases 1 and 2: dotted line, case 1; solid line, case 2; *A*, admitted; *C*, cecostomy; *D*, died.

SUMMARY

Analysis of 163 cases of mercury poisoning at the Mount Sinai Hospital of Cleveland reveals a number in which the patients survived the usual gastric and renal damage but succumbed to a gangrenous colitis. This lesion was apparently successfully prevented in three cases by constant colonic lavage following cecostomy done within a few hours after the ingestion of the poison.

We believe that immediate cecostomy and constant colonic lavage is the most effective measure for the prevention and treatment of the gangrenous colitis. By immediate cecostomy is meant its performance as soon as the patient is admitted, provided he is not in extreme shock. The diagnosis of mercury poisoning is first established by the detection of mercury in the gastric lavage by the electrolytic method of Booth and Schreiber, which can be done in a few minutes.

ABSTRACT OF DISCUSSION

DR. B. S. KLINE, Cleveland: The demonstration at the clinical pathologic conferences at Mount Sinai Hospital of Cleveland of a gangrenous colitis as the most severe active lesion in mercury poisoning terminating in death after the first week, after the full force of the poison had apparently

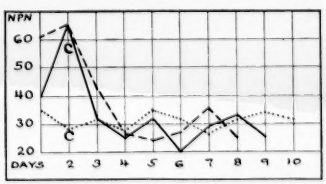

Fig. 7.—Nonprotein nitrogen in cases 4, 5 and 6: solid line, case 4; dotted line, case 5; broken line case 6; *C*, cecostomy.

spent itself and with the kidneys showing evidence of healing, was accepted as a challenge by the clinicians. The answer of Drs. Berger, Applebaum and Young to that challenge is immediate cecostomy. The colonic lesions recorded by Dr. Young are ragged, ulcerated, brownish and greenish and foul smelling.

Although circumscribed and on the crests of the folds at first, they extend and coalesce and finally involve a considerable portion of the inner coats of the colon. A similar lesion occurs in the lower ileum occasionally. In the lesions are found many intestinal bacteria, including filiform and fusiform bacilli, and occasionally intestinal spirochetes are present. The lesion is probably brought about in the following way: Circulating mercury is excreted not only by the kidneys but also through the mucosa of the alimentary canal. After the kidneys have been severely damaged by the heavy metal, more and more of it passes through the colonic mucosa and damages it sufficiently to allow certain regional bacteria to invade, colonize and produce the gangrenous lesion. Here, then, is a true example of the much abused phrase "the lowering of resistance of tissue." Mercury similarly reduces the resistance to infection of the gingival mucosa, sometimes even after small therapeutic doses. After the gingival mucosa is damaged sufficiently by the mercury it is invaded by oral spirochetes, fusiform bacilli and vibrios and a gangrenous gingivitis results. It is reasonable to believe that constant colonic lavage, by diluting the mercury at least after its excretion through the colonic mucosa and especially by interfering with the invasion and colonization of pathogenic bacteria, may prevent the development of gangrenous colitis.

DR. E. B. KRUMBHAAR, Philadelphia: It is not for a pathologist to evaluate the possible damage of a major operation to an individual already poisoned, such as cecostomy would be in the present instance, but I wanted merely to raise that point and to suggest the possibility that it would be preferable to hold this as an interesting suggestion until Dr. Berger and his colleagues or others had obtained additional information on the subject. Their cases indicate clearly that, if the operation is to be used early, immediate cecostomy gives the best results. On the other hand, their figures and those of others show that many persons with mercuric chloride poisoning will get well under the present methods of treatment, and it is impossible immediately to have any idea whether the person is going to die or get well. In the fatal cases death usually occurs in the first forty-eight hours after ingestion of the mercury. The authors' figures showed that in the fatal cases 67 per cent of the patients died within twenty-four hours, a further 29 per cent within the next twenty-four hours. If I am correct in this, that gives the astonishing figure of 96 per cent of the proved cases fatal in the first forty-eight hours. It is difficult to believe that cecostomy will turn the tide in most of these cases, so that one is taking many patients that are going to recover anyhow, a certain number that are going to die in the first forty-eight hours, and others who are on the borderline and submitting them to what must be a serious operation, in the hope of helping a relatively small number who otherwise are going to succumb much later. My experiences at the autopsy table support the authors' statements in regard to the importance of the colonic lesions, and particularly in the case of persons dying earlier. In one of their tables it was shown that even in what one might call the kidney period there were variable colonic lesions. I have also found that even in persons dying one, two or four days after ingestion of the mercury there would be marked colonic lesions which possibly would have gone on to gangrene, so that immediate cecostomy and colonic lavage is indicated as useful right from the start for those persons who would not have died within the first day or two. I feel, therefore, that one may draw two important conclusions from the authors' interesting contribution: One is that this is an extremely interesting problem, solvable by experimental methods; the second is that until the information that such studies may give is available, it would be better to consider this procedure as still in the experimental stage.

DR. SAMUEL GOLDBLATT, Cincinnati: It is known that in persons taking mild mercurous chloride, receiving mercury for syphilis or utilizing other drugs in which the metal occurs as a contaminant, one may find the mercury in the gastric secretions and fecal material passed by the patient for a long period. In the Cincinnati General Hospital in 1927, of some 38 patients in whom a diagnosis of mercurial poisoning was made, 19 were found not to have been given mercury at all. Of the remaining 19 patients, 15 got well and 4 died. In the 4 fatalities, all types of treatments were utilized. In my experiments on dogs, whether I gave the tablet as dry powder, in aqueous solution, in milk, with calcium sulphide, or immediately followed by sodium thiosulphate, the animals all died if they were permitted to retain the material for thirteen minutes or more. Therefore, I believe that the authors are continuing a fallacy when they state that it makes a difference whether the tablet is taken as a dry powder or in solution. My experience indicates that patients who do not retain a lethal oral dose for fifteen minutes will recover regardless of treatment. They may show severe symptoms of mercurial poisoning but no fatalities. The emesis interval is the most important index clinically and experimentally available at present which indicates whether or not a person or an animal subjected to mercury by mouth will recover. I was greatly surprised that no mention of disease of the liver was made. I have always been impressed with the marked pathologic changes in the liver. They are visible especially as a mottled, fatlike degeneration of the hepatic cells, and as a great distention of the gallbladder. I also found at autopsies of animals and in some human beings that the region of the duodenum immediately surrounding the entrance of the common bile duct was hemorrhagic, just as hemorrhagic as was the colon. Following this lead, I devised a treatment, used solely in the experimental animal, of immediate cholecystostomy. It was intended to add another portal of discharge for the mercury. It has been shown that 95 per cent of the mercury taken by mouth is concentrated in the liver within the first hour after ingestion. If, therefore, a person is actually poisoned by mercury, the treatment that produces the most rapid excretion from the liver would be the procedure of choice.

DR. A. A. HEROLD, Shreveport, La.: I believe that the persons with mercurial poisoning who have come under my observation and who survived initial shock have all died by the renal route with acute suppression of urine. There have been so many of these cases that the physicians in one of the clinics in my home town have established the routine of doing an immediate renal decapsulation when they get a patient with acute mercurial poisoning who is not severely shocked. They have had good results in the cases in which they have been able to do it early. I am simply mentioning this in passing because the patients who have died in my experience have not died by the intestinal route.

DR. SAMUEL S. BERGER, Cleveland: Undoubtedly many patients with mercuric chloride poisoning will get well regardless of the treatment instituted. What one cannot tell is which patients will recover and which will not. We are simply recommending this suggestion to cope chiefly with one phase of mercury poisoning, namely, the factor of the colon, which we have found to be extremely important. We pointed out that there are three chief causes of death in mercuric chloride poisoning: First is shock, which occurs in the first forty-eight hours. We said that in the fatal cases 67 per cent of the patients died in the first forty-eight hours; 38 per cent of these (67 per cent) died in the first twenty-four hours, and 29 per cent in the second twenty-four hours, in shock. The treatment that is indicated is the overcoming of the shock and the elimination of the mercury, and, if the patients are not in extreme shock, cecostomy in addition. If they survive the shock, they may die of a necrotizing nephrosis. This is the second chief cause of death. We use the established methods in vogue at present for the treatment of the renal complications. We have had no experience with decortication. The reports in the literature do not seem to be encouraging. If the patients survive the renal damage, death may subsequently occur from a gangrenous colitis, which forms the third chief cause of death. The repeated demonstration by our pathologist, Dr. Kline, of gangrenous colitis as a cause of death, led us to seek some method whereby we could obviate this serious complication. We again resorted to cecostomy and lavage, which we had tried years before without results, but we thought to try it earlier, that is, as soon as symptoms of colon irritation appeared, and not as a last resort. This was followed by equally disappointing results; and then finally we tried this procedure before symptoms appeared, as soon as a diagnosis of mercury poisoning was made. Doubtless we cecostomize patients who might recover without the operation but we save a good many of them that would otherwise succumb.

It is a simple procedure and does not add to the mortality, and we feel that it is a highly useful measure and worthy of trial by others. We, too, have observed liver damage in mercuric chloride poisoning, at autopsy, but we wished to emphasize the colonic involvement as an extremely important phase of mercury poisoning, and one of the three chief causes of death, and suggested a method that is helpful in coping with it.

MELORHEOSTOSIS LÉRI: A FLOWING HYPEROSTOSIS OF A SINGLE EXTREMITY

REPORT OF TWO CASES *

ERNEST KRAFT, M.D.
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In 1922, Léri and Joanny [1] described a new type of hyperplastic bone lesion which is confined to a single extremity, extending from one end to the other in a linear track but usually leaving a few unaffected areas along the course. The term "melorheostosis" is derived from the Greek (*μέλος*, limb; *ῥέω*, flow) and means "flowing hyperostosis of a limb." The disease was independently described three years later by Lewin and McLeod,[2] as an osteosclerosis. Other terms applied by early writers on the subject were "osteosis eburnisans monomelica" [3] and "osteopathia hyperostotica congenita (unius membri)." [4]

PATHOLOGY

The disease is characterized by proliferation of ivory-like new bone in the cortical areas. The lesions may assume different forms in different parts of the extremity, sometimes resembling osteoma, at other times suggestive of spurs, periostosis, calcinosis, or osteoplastic malignant conditions. When the proliferative process has caused considerable expansion, the hyperplastic material is of irregular wavy contour, with numerous hills and valleys, forming a linear track parallel to the long axis of the bone. Léri has likened these irregular masses, running downward from the shoulder or pelvis, to the molten stream of a candle. The sharp localization of the process to one side of a bone was compared by Lewin with a condition in which it rains on one side of the street and not on the other. The distribution does not correspond with the course of vessels or peripheral nerves.

Some observers have described stripes of dense bone within the cortex (condensed zones) encroaching on the medullary canal, but it is probable that these are really hyperostotic ridges on the surface of the cortex according to stereoscopic and tangential views. Another characteristic feature is the occurrence of bony masses in the soft parts of the shoulder or hip. These formations are irregular and partly confluent and contain negative shadows caused by islands of cartilage. In spite of bizarre features, a certain similarity in different cases is evident.

As the disease advances, pathologic products are deposited in periarticular areas, occasionally causing complete fixation of a joint. The unaffected parts of bones adjacent or opposite to the hyperostosis frequently show decalcification and rarefaction. There is rarely a bowing of the diseased bones, and, in contrast to other disorders, one finds an extreme compactness of the deformed extremity. Pathologic fracture has never been described in melorheostosis. This feature is characteristic and of importance in differential diagnosis. When the masses assume larger dimensions, pressure on nerves and blood vessels may result in transitory edema, congestion of veins, and neuralgia. Such alarming conditions, however, respond readily to immobilization and tend to disappear in a short time. Tender, indurated erythematous areas are sometimes present on the skin of the affected extremity.

Measurements of circumference of the limbs have not yielded uniform results. In some cases there is much muscular atrophy which causes decreased circumference on the affected side in spite of the fact that

Tabular Description of Sixteen Cases of Melorheostosis

No. of Case	Year Published	Author	Extremity	Age	Age of Onset	Years Observed	Sex*	Shortening of Extremity	Lengthening of Extremity	Heterotopy	Histology
1	1922	Léri-Joanny [1]	Left upper	39	10	6	♀	.....	.....	+	+
2	1925	Lewin-McLeod [2]	Right upper	35	6	..	♂	.....	.....	..	..
3	1926	Muzii [5]	Left lower	10	5	½	♀	.....	2 cm.	..	..
4	1927	Putti [3]	Left lower	8	7	..	♀	4 cm.	.....	..	+
5	1927	Zimmer [4]	Left lower	32	21	..	♂	.....	1.5 cm.	..	+
6	1927	Meda, Giulio: Radiol. med. **14**: 885 (Oct.) 1922	Right upper	..	..	..	..	.....	.....	..	..
7	1928	Valentin [18]	Right upper	17	15	..	♀	3 cm.	.....	..	..
8	1928	Meisels [8]	Right lower	25	21	..	♀	3 cm.	.....	+	..
9	1929	Kemkes [6]	Right upper	54	42	1	♂	.....	.....	+	..
10	1930	Milani, Eugenio: Arch. di Radiol. **6**: 70 (Jan.-Feb.) 1930	Right lower	..	..	..	♂	.....	.....	..	..
11	1930	Léri, Loiseleur and Lièvre: Bull. et mém. Soc. méd. d. hôp. de Paris (**54**): 1210 (July 14) 1930	Right upper	39	29	1	♂	.....	.....	..	+
12	1930	Kahlstorf [19]	Left lower	33	30	1½	♂	.....	.....	..	..
13	1930	Junghagen [9]	Right upper	..	..	4	♂	.....	.....	..	+
14	1931	Piergrossi, Aldo: Arch. di radiol. **7**: 20 (Jan.-Feb.) 1931	Right lower	36	14	..	♂	.....	.....	+	..
15	1931	Personal	Left upper	40	22	1	♂	.....	.....	+	..
16	1931	Personal	Right lower	37	23	14	♀	.....	.....	+	..

5 cases in Italy, 4 in Germany, 3 in United States, 2 in France, 1 in Poland and 1 in Sweden

* In this column, ♂ denotes male; ♀, female.

* From the Division of Roentgenology, University of Chicago.
* Read before the Section on Radiology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

1. Léri and Joanny: Une affection non décrite des os: Hyperostose en coulée sur toute la longeur d'un membre ou mélorhéostose, Bull. et mém. Soc. méd. d. hôp. de Paris **46**: 1145 (July 21) 1922. Léri, André; and Lièvre, J. A.: La mélorhéostose, Presse méd. **38**: 801 (June 27) 1928; La mélorhéostose (Présentation de radiographies), Bull. et mém. Soc. de radiol. méd. de France **16**: 226 (Nov.) 1928.

2. Lewin, Philip; and McLeod, S. B.: Osteosclerosis with Distribution Suggesting That of the Ulnar Nerve: An Unclassified Bone Condition, J. Bone & Joint Surg. **7**: 969 (Oct.) 1925.

3. Putti, Vittorio: Una nuova sindrome osteopatica: L'osteosi eburneizzante monomelica, Chir. d. org. di movimento **11**: 335 (June) 1927.

4. Zimmer, P.: Ueber einen Fall einer eigenartigen seltenen Knochenerkrankung, Osteopathia hyperostotica—Melorheostose, Beitr. z. klin. Chir. **140**: 75, 1927.

the volume of bone is increased. Length measurements have been done in five cases, but the procedure appears to be of no diagnostic value because asymmetry of the extremities is so common in otherwise normal subjects. Further clinical information may be obtained from the accompanying tabular arrangement.

SYMPTOMATOLOGY

The first signs are noted as a rule during childhood or adolescence. Of fourteen cases, the history began after the period of bone development in only four. Since the onset is quite insidious and the progress extremely slow, it is impossible to obtain reliable data as to the first manifestation. Muzii's [5] patient was 5 years of age and Kemkes' [6] patient, 42 years of age when symptoms began. Between these two extremes the average age of first complaint is 19 years among twelve patients. The spread between onset and first examination was twenty-nine years in the first two cases. The symptoms, even in advanced cases, may be extremely vague. In children the subjective symptoms are more pronounced than in older persons, although the roentgen observations are not as striking.

Fig. 1. (case 1).—Striking deformities of left thumb and radial side of index finger. There is a complete fixation of the first metacarpal in midposition.

The first deformities are sometimes accompanied by pain. More often they develop without any symptoms. Invariably the lesions are painful at some stage of their progress. The pain is not intense. It is provoked by strain and pressure and disappears either gradually or suddenly—sometimes for years despite persistent progress of the lesions. The most annoying symptoms are transitory stiffness and limited motion of joints, and the occasional instances of permanent ankylosis.

CASE 1 (referred by Dr. E. B. Coolley in June, 1930).—H. W., a man, aged 40, a trainer of horses, during the war served as stable sergeant and contracted severe epidemic spinal meningitis. In 1910 he dislocated his left shoulder. There was no history of syphilis.

His present condition began in 1913 with a hard nodule at the radial side of the left wrist. A year later the patient discovered a small lump under the left clavicle. In 1922 the radial portion of the index finger had grown thick and uneven. Three years later his left humerus had become enlarged. In 1928 nodules appeared on the left thumb. During the last three years he has had frequent numbness of the arm on exercising and impaired motion of the shoulder. Since 1929 he has occasionally noticed a lancinating pain throughout the extremity and has been unable to bend his elbow completely. Transitory pain has also been noted in other parts of the body, especially in the right arm and hand. Lately his left thumb and index finger have become thicker and increasingly stiff. He never has consulted a physician for his condition.

On physical examination the patient appears perfectly healthy. Physical observations are essentially negative, as are also the neurologic tests, examinations of the urine and blood and chemical examination of the blood, including calcium and phosphorus. The Wassermann and Kahn tests are negative. The electrocardiogram is within normal limits.

The left shoulder is somewhat elevated. A hard, nodular, slightly movable mass, the size of an apple, bulges under the skin in the subclavicular groove. Several smaller nodules of cherry size are felt within the pectoralis major muscle. The upper arm is large and deformed. On deep palpation a wavy mass of bone is felt in the distal humerus, bulging under the biceps muscle. There is a moderate thickening of the radius. The thumb and the radial side of the index finger and the wrist show gross deformities with multiple hard nodules bulging under the skin (fig. 1).

The muscles of the left arm are slightly underdeveloped as compared with the normal right side. Motions of the left shoulder are limited as to high elevation and posterior rotation. This condition, however, varies on repeated observations. Flexion and pronation of the forearm are limited. Dorsiflexion of the wrist is somewhat impaired. There is complete fixation of the first metacarpus and impaired motion of the thumb and index finger. The two arms are of equal length. The affected humerus is enlarged, and the circumference of the left hand is decreased.

On a subsequent examination the affected arm was edematous and showed evidence of venous congestion. In March, 1931, the skin of the left arm presented multiple small erythematous areas and indurations, which were somewhat sensitive.

Roentgen examination (figs. 2 and 3) reveals a large confluent triangular mass of calcium density with irregular borders occupying the left subclavicular space, displacing the clavicle and scapula in an upward direction. The mass overlaps the coracoid process and ends with a downward spur in the anterior parts of the collum scapulae. Another spur overlaps the midclavicle. Numerous smaller nodular densities are projected into the soft parts between the upper humerus and the lateral chest wall. Another identical mass is attached to the cartilagenous junction of the first rib. The anterior humerus is occupied by hyperostotic material with irregular dented borders, while the medullary canal, the posterior parts and the condylar region are not affected. There is a slight interruption of the flow between the upper and middle thirds. The dripping-like deposits become increasingly larger in the distal parts. The hyperostosis continues in the head of the radius, involving the entire bone. The ulna shows only two small spurs below the coronoid process and a moderate posterior bowing of the proximal part. In the region of the wrist only the naviculare, lunatum, multangulum majus and minus are densified. The second metacarpal and the proximal phalanx of the index finger are involved by massive hyperostosis on the radial side, the middle phalanx showing only a slight spur. The first metacarpal and its proximal joint are wrapped in dense masses; likewise both phalanges of the thumb. The unaffected parts of the diseased extremity show varying degrees of decalcification and rarefaction.

The right forearm is slightly curved and the metacarpals of the right hand appear somewhat clumsy, leaving the impression of some developmental disturbance. All other parts of the skeleton are normal. Biopsy material is not obtainable.

Case 2, when reported by Geschickter [7] and others as ossifying periostitis, appeared so similar to previously described cases of melorheostosis of the lower extremity that it was tempting to make further studies on it. Dr.

5. Muzii, Mario: Iconografia rara di malattie delle ossa, Radiol. med. **13**: 435 (June) 1926.

6. Kemkes, Heinz: Ueber einen Fall seltener Erkrankung der Knochen einer Extremität, Arch. f. klin. Chir. **156**: 268, 1930.

7. Geschickter, C. F.: The Roentgenologic Diagnosis of Bone Tumors, Radiology **16**: 111 (Feb.) 1931.

Geschickter kindly lent his material and furnished the following information:

CASE 2.—A. E. D. (a patient of Dr. O. L. Miller, Charlotte, N. C.) a white woman, aged 30, seen in September, 1923, complained of pain in the hip for the past ten days. There was just enough pain to annoy her. In 1916, when she was 23, she had pain and discomfort in the right hip. She had consulted Dr. Baer of Baltimore, who diagnosed the condition as osteomyelitis. It was suggested that she continue to use her leg. Two roentgenograms were taken. The right thigh was slightly larger than the left, and she had about 10 degrees of motion in the hip. There was good position. No operation was done, nor drainage of pus. Since 1916 the patient has considered herself well with only limitation of motion at the hip. She has not consulted a physician in the meantime about her hip. A Wassermann reaction was negative. The leukocytes numbered 14,000.

In January, 1924, the patient was well. No new symptoms appeared; the discomfort in the hip did not bother her at this time.

In April, 1930, the patient was well. A roentgenogram showed the condition in the quiescent stage.

The patient was not seen after this time. Dr. O. L. Miller of Charlotte, N. C., who has kindly cooperated, has renewed contact with the patient and examined her in May, 1931. At this time he noted but little change except for a complete ankylosis of the right hip.

A roentgen examination in May, 1931, revealed the following: The pathologic process involved the right hip and the proximal three fourths of the right femur (fig. 4). The hip was overlapped by irregular confluent shadows of calcium density. The joint was entirely obscured by the abnormal products. Smaller independent shadows were seen on the outside of the large mass between the greater trochanter and the iliac bone. The large mass covered the entire femoral neck and the lesser trochanter. It continued along the inside of the femoral shaft as a wavy ridge of the cortex. In the distal parts the mass became more uniform and regular and faded

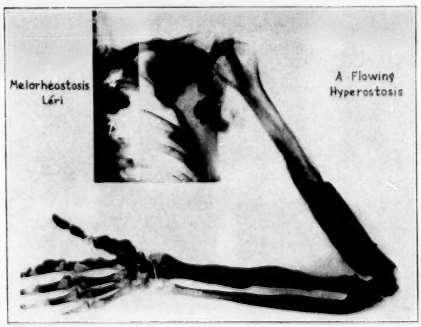

Fig. 2 (case 1).—Composite view of the left arm. Hyperostosis extends from first rib (arrows) in a continuous flow to phalanges.

gradually away. The flowing process continued from the hip downward without interruption. No hyperostosis was seen in the leg or foot.

The case of Meisels [8] (fig. 5) is shown for the similarity of the heterotopic masses in the inguinal region with the subclavicular formations of case 1. The inguinal mass and the hyperostotic flow differ in location from case 2 (fig. 4). The process is on the outside of the femur and extends downward to the lateral parts of the foot, while in cases with lesions on the inside of the femur the flow continues to the medial portions of the foot.

HISTOLOGY

Biopsy studies have been made in five cases. Putti found an abundance of capillary vessels which were partly obliterated. The vascular pathologic condition is a single observation and is not in accord with the observations of other investigators. Léri found a bone marrow rich in cells, islands of cartilage and primitive haversian canals. In his second case he described much irregularity and crowding of abnormal osseous lamellae in various angles. Junghagen [9] mentioned narrowing of lamellae which are elongated and poor in cells. There was, however, always a regular concentric arrangement around the haversian canals. Kauffmann [10] studied Zimmer's case histologically and corroborated the finding of a primitive bone tissue.

Fig. 3 (case 1).—Anteroposterior view. The hyperostotic spurs of proximal radius and ulna, which are well seen in figure 2, appear like intracortical zones of condensation.

ETIOLOGY

Four theories have been advanced to explain the etiology; vasomotor neurosis, infection, endocrine-constitutional disturbance, and embryonic defects.

1. Putti considered the isolated observations of eosinophilia and of abundant, partly obliterated, capillaries as significant for a lesion of the sympathicus. In his opinion the nutrient arteries were primarily involved, since the dense lines were parallel to the main axis of the bone. With his theory another discussion has been opened: Does vascular obstruction cause sequestration and secondary eburnization of bones, or is an increased blood supply responsible for sclerotic bone changes? Putti's theory does not explain the involvement of small bones, of soft parts in shoulder and hip and the selective distribution.

2. Léri advanced the theory of an infectious agent. He believed that the cutaneous phenomena were caused by embolism, but he did not succeed in isolating parasites. Material transplanted into apes was absorbed in less than a year.

3. The coincidence of Meige's trophedema in the case of Meisels and Goldschlag [11] with the presence of hyperthyroidism and hypopituitarism led to the endocrine-constitutional theory. A craniostenosis in Putti's

8. Meisels, Emil: Nouvelle observation de mélorhéostose, Presse méd. **36**: 1466 (Nov. 17) 1928; La melorheostose présenté par Léri, Bull. et mém. Soc. méd. d. hôp. de Paris **52**: 1531 (Nov. 22) 1928; Bull. et mém. Soc. de Radiol. méd. de France **16**: 241 (Nov.) 1928; Das Krankheitsbild der Lérischen Melorheostose, Röntgenpraxis **1**: 680 (Oct. 1) 1929.

9. Junghagen, Sven: Sur la mélorhéostose, J. de radiol. et d'électrol. **14**: 495 (Sept.) 1930.

10. Kauffmann: Demonstration, Zentralbl. f. Chir. **56**: 1631 (June 29) 1929.

11. Goldschlag, F.: Ueber eine Kombination von Trophödem Meige mit Melorheostose Léri, Dermat. Wchnschr. **89**: 1761 (Nov. 2) 1929.

case and a slight developmental disturbance of the opposite arm in my case (case 1) may substantiate these ideas. Such observations, however, are too infrequent to allow definite conclusions.

Hereditary factors do not play a dominant rôle. The histories are negative in this respect except for a "crippled" hand of the grandfather in Zimmer's case.

Fig. 4 (case 2).—Characteristic flowing hyperostosis of proximal three fourths of the right femur with heterotopic masses over the hip joint. In Muzii's case the flow extended on the same side downward to the first metatarsal, while in the other cases the lateral parts of the entire extremity were involved.

4. An explanation of the selective linear distribution of pathologic changes is found in Zimmer's theory of a metameric disturbance. Zimmer thought that the hyperostotic bands could be traced to a single truncal segment and he assumed an embryonic lesion prior to the budding process of the extremity. Apparently undifferentiated cells of a metamere become isolated and remain dormant until later in life after they have spread over the limb. These groups of cells seem to lack a synchronous formative stimulus and produce a primitive type of bone according to microscopic observations. Large deposits of calcium are further evidence of their primitive character.

In connection with the embryonic theory, however, some fundamental facts have to be considered. The belief that limbs originate mainly from fused truncal segments is based on the distribution of nerves and their relation to spinal segments by means of the plexus. On the other hand, animal experiments do not support the theory of a metameric construction of extremities. The studies of Harrison,[12] Byrnes[13] and Mangold[14] on amphibia and fish have shown that the unsegmented mesoblast of the somatopleure is a primary factor in the formation of limbs. Lewis[15] has demonstrated that injury to myotomes in the limb region of amblystoma, while producing muscular defects, has no effect on the development of the limb itself. When undifferentiated cells of limb buds and other mesodermic tissue are transplanted to other parts of the trunk, perfect extremities develop and the nerves of these artificial limbs communicate with the spinal ganglions by means of a newly formed plexus. Experiments on higher vertebrates are still lacking in view of the technical difficulties, but so far embryologic studies have failed to support the metameric theory and the exact nature of melorheostosis is still unexplained.

12. Harrison, R. G.: Experiments on the Development of the Fore Limb of Amblystoma, a Self-Differentiating Equipotential System, J. Exper. Zool. **25**: 413 (April) 1918.

13. Byrnes, E. F.: Experimental Studies on the Development of Limb-Muscles in Amphibia, J. Morphol. **14**: 105, 1898.

14. Mangold, O.: Das Determinationsproblem: Zweiter Teil: Die paarigen Extremitäten der Wirbeltiere in der Entwicklung, Ergebn. d. Biol. **5**: 290, 1929.

15. Lewis, W. H.: The Relation of the Myotomes to the Ventrolateral Musculature and the Anterior Limbs in Amblystoma, Anat. Rec. **4**: 183 (May) 1910.

COMMENT

The question of selectivity of a single extremity still awaits a definite solution. Although Léri emphasized the isolated occurrence as characteristic, he observed in his first case the development of heterotopic nodules on the opposite side. Do potential foci of hyperostosis remain dormant in parts of the extremity and in other limbs? Seth Hirsch[16] in his excellent discussion of osteitis fibrosa correlates similar bilateral pathologic conditions with Léri's disease. His view is partly supported by observations of a constitutional disturbance. There is some similarity with a generalized bone disease: infantile osteopathia hyperostotica multiplex—independently described by Engelmann[17] and Seth Hirsch, but additional observations are necessary to decide the question of a generalized involvement.

DIFFERENTIAL DIAGNOSIS

Considering the characteristic features, one may find little difficulty in differentiating the disease from other bone disorders of inflammatory and dysplastic nature. Tuberculous and syphilitic osteitis can be ruled out by history, physical examination and serologic tests. Also malignant neoplasms have to be disregarded in the absence of additional observations.

Fig. 5.—Reproduction of Meisels' case (by permission of author). There is a striking resemblance of the subinguinal shadows with the suhclavicular masses of case 1 (compare with figure 2). The hyperostotic bands are located on the outside of the femur in contrast to the medial course in case 2 (fig. 4).

PROGNOSIS

The disease usually shows a very slow progress and may become stationary for years. The prognosis is

16. Hirsch, I. S.: Generalized Osteitis Fibrosa, Radiology **12**: 505 (June) 1929; **13**: 44 (July) 1929.

17. Engelmann, Guido: Ein Fall von Osteopathia hyperostotica (sclerotisans) multiplex infantilis, Fortschr. a. d. Geb. d. Röntgenstrahlen **39**: 1161 (June) 1929.

favorable. There has never been any evidence of a malignant character. These facts should be kept in mind before any radical therapy is attempted.

TREATMENT

No definite therapeutic achievements have been reported. Because of the meager symptomatology the patients are frequently hesitant in submitting themselves to therapy. Surgical correction is rarely indicated. Valentin [18] and Kahlstorf [19] reported relief from heat and physical therapy. In case 1 an improvement was observed when repeated roentgenograms were taken in one session. One has to keep in mind, however, that spontaneous remission of symptoms is a characteristic feature of the disease. It would be instructive to apply radiation therapy systematically. One might then gain a better knowledge of the biology of the abnormal cells and subsequently of the unexplained pathogenesis.

ABSTRACT OF DISCUSSION

DR. PHILIP LEWIN, Chicago: My interest in this subject dates back to 1923, when Dr. MacLeod showed me a set of roentgenograms of a patient whose case I reported before the American Orthopedic Association in 1925. I searched the literature without success. Then I showed the films to the leading orthopedic surgeons in eleven countries, to many roentgenologists, to neurologists, and finally to Sir Arthur Keith in London. No one was able to classify the condition for me. Some time later, Putti sent me a reprint of an article he wrote on the subject. Then I received a reprint from Léri. Within the last three weeks, I had a long discussion in Paris with Lièvre, an associate of Léri, who is publishing a monograph on the subject. He has collected fifteen cases. He has no conception of the etiology. His experimental work was inconclusive. The theories that one should consider are the neurogenic, myogenic, vascular, metameric and endocrine.

DR. H. K. PANCOAST, Philadelphia: I should like to ask whether there has been any particular study along the line of parathyroid tissue disturbances in these cases. When one analyzes the appearance, in a way it seems to be just the opposite from that which is seen in certain parathyroid cases. The question arose in my mind as to whether a parathyroid hormone had been used experimentally in any case of this kind. There is also a certain similarity in the appearance between this condition and the one that has been described as osteopoikilia by Ledoux-Lebard, in which one sees the small round spots distributed apparently through the medullary portion of the bones in certain portions of the body, especially the pelvis and upper femurs, and even in the lower portion of the lower extremities and in the hands.

DR. LEON T. LE WALD, New York: Dr. Kraft kindly showed me his case. At first glance I thought it was related to the condition known as calcinosis, but careful study of calcinosis, of which I have had two cases and have seen two others, showed that in calcinosis the calcium deposits are distinctly separate from the bones, although where the masses of deposits of calcinosis are very large they might simulate to a casual observer the possibility that they were related in some way to a bony lesion. I am convinced that there is no relationship unless, as Dr. Pancoast suggests, all these calcium changes are associated with parathyroid disease. Otherwise I should say that calcinosis is in no way related to this particular condition of melorheostosis.

DR. ERNEST KRAFT, Chicago: In regard to Dr. Pancoast's remarks, I do not remember any literature on the parathyroid in connection with the disease. Meisels found hyperthyroidism in his case—a single observation which has probably no relation to the bone condition. A theory of the parathyroid would not explain the peculiar distribution over a single extremity. Osteopoikilia, or spotted bones, has been mentioned in the differential diagnosis. The process is within the bone and not expansive. Its distribution is more general, while melorheostosis is confined to one limb. In regard to Dr. Le Wald's remarks on calcinosis, I agree that there is some resemblance. However, calcinosis does not show hyperostosis and presents different histologic changes.

18. Valentin, B.: Klinische Demonstration, Fortschr. a. d. Geb. d. Röntgenstrahlen **37**: 871, 1928; Ueber einen Fall von Melorheostose, ibid. **37**: 884 (June) 1928.

19. Kahlstorf, A.: Zur Kenntnis der Melorheostose (Léri) und der generalisierten Ostitis condensans oder Osteopoikilie (Albers-Schönberg), Röntgenpraxis **2**: 721 (Aug. 15) 1930.

ACUTE STAPHYLOCOCCAL INFECTIONS OF THE KIDNEY

THEIR CLINICAL ASPECTS AND TREATMENT *

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This paper deals with the discussion of a series of forty-eight cases of acute staphylococcal kidney infection observed and treated at the University Hospital during the past three years. Certain facts concerning the pathology, diagnosis, relationship to secondary invading organisms and treatment that are brought out by these cases are felt to be of particular interest.

The cases here reported did not have any apparent preexisting infection of the urinary tract and were uncomplicated by any discernible obstructive lesions.

INCIDENCE

The staphylococcus is present in a surprisingly high proportion of infections of the urinary tract. Young [1] found it in 49 per cent of 356 cases studied. Helmholz [2] found 15 per cent of all cases studied at the Mayo Clinic to be due to some form of the coccus. Kretschmer [3] found the staphylococcus in 20 per cent of 200 cases uncomplicated by stone, tumor, stricture, prostatic enlargement or tuberculosis. Rovsing [4] in a similarly controlled series found the staphylococcus in 25 per cent of cases. Hellström [5] in 507 cases found it in 30 per cent.

For this series of acute infections the age incidence ranged from 4 to 49 years, the average being 26. Sex incidence showed a preponderance of males, 31 to 17. Involvement of the right side was seen thirty-one times and of the left twelve, with bilateral involvement occurring in five instances.

ETIOLOGY

The question of etiology has been in the past the subject of much study as well as of no little controversy. Since the days of Albarran,[6] who accepted the hematogenous as the most probable route in this type of renal inflammation, which he first described, others have established the fact without question. The contributions of Ekehorn,[7] Legueu,[8] Koch,[9] Runeberg,[10]

* From the Department of Surgery, University of Michigan Medical School.

* Read before the Section on Urology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. Young, H. H., and Davis, D. M.: Young's Practice of Urology, Philadelphia, W. B. Saunders Company, 1926.
2. Helmholz, H. F., and Amberg, Samuel: Diseases of the Genito-Urinary System in Infancy and Childhood, vol. 19, Clinical Pediatrics, New York, D. Appleton & Co., 1930, p. 140.
3. Kretschmer, H. L.: The Treatment of Pyelitis, Surg. Gynec. Obst. **33**: 632 (Dec.) 1921.
4. Rovsing: Klinische und experimentelle Untersuchungen über die infectiösen Krankheiten der Harnorgane, Berlin, 1898.
5. Hellström, John: Beitrag zur Kenntnis der Staphylokokken Pyelitis, Acta chir. Scandinav. Supp. 6, 1924.
6. Albarran, Joaquin: Étude sur le rein des urinaires, Thèse de Paris, 1889.
7. Ekehorn: Om den infectiösa pyelonefriten, Hygiea, 1918.
8. Legueu: Les staphylococcies d'origine urinaire, Progrès méd. **29**: 394, 1913.
9. Koch, J.: Ueber das Vorkommen pathogener Staphylokokken auf der Körperoberfläche des Menschen, Ztschr. f. Hyg. u. Infektionskr. **58**: 287, 1907; Ueber die hämatogene Entstehung der eitrigen Nephritis durch den Staphylococcus, ibid. **61**: 301, 1908.
10. Runeberg, quoted by Hellström (footnote 5, p. 100).

Brewer,[11] Cunningham,[12] Cabot and Crabtree[13] and, more recently, those of Bumpus and Meisser[14, 15] are of particular importance.

In our series, thirty-four cases, or 67 per cent, showed definite foci considered as directly responsible. Of this group, fifteen were acute inflammations of the ear, nose and throat, five were boils, three followed "catheter chill" and three defloration with chill. In regard to the last two factors, the recent work of Scott[16] at the Brady Institute in Baltimore is of great significance. He demonstrated transient positive blood cultures in eighty-two patients having reactions following instrumental or operative manipulations of the genito-urinary tract. In twenty-four cases showing positive cultures of staphylococci, the same organisms were subsequently recovered from the urine. Trauma was an etiologic factor in but one of our cases.

PATHOLOGY

Grossly, the kidney is enlarged from congestion and edema, with multiple small areas of suppuration disseminated throughout the cortex. These small abscesses

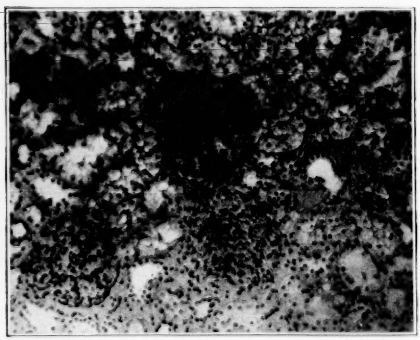

Fig. 1.—Three glomeruli showing active early inflammation with fibroblastic proliferation and increase of wandering cell nuclei. Fusion of capillary loops and Bowman's capsule. (High power; hematum eosin stain.)

may enlarge to varying degrees, rarely even involving the entire parenchyma. These more extensive suppurative processes have been described by many authors, who have applied the terms abscess of the kidney, acute renal suppuration, septic infarct of the kidney and renal carbuncle to the lesion. While these severe degress of renal suppuration do occur, I feel that they are extremely rare. Young,[17] Cabot,[18] Bugbee,[19] Baker,[20] Bolton[21] and Hellström[5] are but a few of those who have shared this opinion. Rupture of a cortical abscess through the renal capsule with subsequent perinephric suppuration is a common sequela. The medullary zone rarely shows infection of importance, while the pelvis is practically never inflamed.

Microscopically, it is apparent that the initial lesion is a glomerular one, from which the inflammatory process extends. Albarran,[6] Rovsing,[4] Brewer,[11] Cabot and Crabtree,[13] Young,[1] Chown,[22] and Wilson and Schloss[23] have amply demonstrated these facts. Characteristically there are many of these microscopic areas of suppuration throughout the cortex. The location of the lesion undoubtedly explains the rarity of pyuria. That healing takes place rapidly has been clearly demonstrated microscopically. The great vascularity of the cortical zone is probably to a large measure responsible for this rapid and complete healing of the infected areas. Photomicrographs made of sections removed from the renal cortex of patient 47 demonstrate all stages of the process, including almost complete healing. The specimen was removed on the eighth day of this patient's illness, when a small perinephric abscess was drained. Wilson and Schloss[23] have shown that when complete healing has occurred there is little evidence of important damage to the renal parenchyma, although microscopic scars are to be seen.

SYMPTOMS

In this series the mode of onset, general symptomatology and progress of the disease have shown a striking uniformity. In all but three instances the onset was abrupt, with pain as the initial symptom, generally accompanied by a chill.

Pain and costovertebral tenderness were present in forty-seven of the forty-eight cases. The pain is generally of moderate severity, typically renal in its location, and constant and aching in character. If extremely severe, it may simulate renal colic, radiating down the course of the ureter to the genitalia. Bladder irritation occurred in but half of our cases. Chills occurred during the course of the disease in thirty-four instances.

Constitutional symptoms of infection are the rule. These include loss of appetite, malaise, general weakness, occasionally prostration and rarely nausea and vomiting. High fever is the rule, many patients having a temperature of 104 or 105 F. The temperature characteristically runs an irregular course as in sepsis elsewhere. The average high temperature in our series was 102 F.

Leukocytosis is constant, not infrequently being high. The lowest count is this series was 9,200, and the highest 33,000. The average was 16,400.

URINE

Gross hematuria accompanied the onset of symptoms in eight cases of this series. In each instance it was of less than forty-eight hours' duration. Microscopic hematuria is by no means uncommon. A trace of albumin is the rule.

11. Brewer, G. E.: The Pathology, Diagnosis and Treatment of Acute Unilateral Septic Infarcts of the Kidney, New York M. J. **85:** 1013, 1907; The Present State of Our Knowledge of Acute Renal Infections, J. A. M. A. **57:** 179 (July 15) 1911; Acute Hemic Infection of the Kidney, Am. J. Urol. **9:** 549, 1913.

12. Cunningham, J. H.: Acute Unilateral Hematogenous Infection of the Kidney, Ann. Surg. **56:** 818, 1912.

13. Cabot, Hugh; and Crabtree, E. G.: Etiology and Pathology of Nontuberculous Renal Infections, Surg. Gynec. Obst. **23:** 495-537 (Nov.) 1916.

14. Bumpus, H. C., Jr., and Meisser, J. G.: Focal Infection and Selective Localization of Streptococcus in Pyelonephritis, Arch. Int. Med. **27:** 326-337 (March) 1921.

15. Bumpus, H. C., Jr., and Meisser, J. G.: Foci of Infection in Cases of Pyelonephritis, J. A. M. A. **77:** 1475-1479 (Nov. 5) 1921.

16. Scott, W. W.: Blood Stream Infections in Urology, J. Urol. **21:** 527 (May) 1929.

17. Young, H. H., in discussion of Mayo, W. J.: Hematogenous Infections of the Kidney, J. A. M. A. **73:** 1023 (Oct. 4) 1919.

18. Cabot, Hugh; and Nesbit, R. M.: Coccus Infections of the Kidney, Ann. Surg. **92:** 766 (Oct.) 1930.

19. Bugbee, H. G.: Infections of the Urinary Tract in Children, New York State J. Med. **25:** 1063 (Dec. 1) 1925.

20. Baker, J. N.: Surgical Infections of the Kidney, J. Urol. **7:** 307 (April) 1922.

21. Bolton, in discussion of Peck, C. H.: Multiple Septic Infarcts of the Kidney, Ann. Surg. **44:** 619, 1906.

22. Chown, Bruce: Pyelitis in Infancy and Early Childhood: A Pathological Study, Arch. Dis. Child. **2:** 97 (April) 1927.

23. Wilson, J. R., and Schloss, O. M.: Pathology of So-Called Acute Pyelitis in Infants, Am. J. Dis. Child. **38:** 227 (Aug.) 1929.

In every instance the staphylococcus was demonstrated in the urine by staining the sediment, although in some instances its appearancce followed the onset of symptoms by several days. In regard to culture of the urine, it is of interest that in three of our cases repeated cultures were negative in spite of large numbers of the organisms being readily demonstrable in the

Fig. 2.—Advanced inflammation. Marked leukocytic infiltration surrounding the glomerulus and its capsule. (High power; hemalum eosin stain.)

stained sediments. This is by no means an original observation. Cabot and Crabtree,[13] Helmholtz [24] and Hellström [5] have commented on it. Helmholz [24] has suggested that the bacteria in such cases have possibly been rendered sufficiently devital to fail to respond to the usual culture methods. Hadley [25] has found that during certain phases of development of typhoid, paratyphoid, Shiga dysentery and other organisms it is impossible to grow them satisfactorily on any of the known mediums. He has suggested that some such phase of development has been here encountered in the staphylococcus. In either event it would seem that the method of study of centrifugated specimens by stain could be depended on for accurate diagnosis with greater certainty than by culture.

Less than half of the patients in this series showed leukocytes in the urine at any time during their illness. This absence of cells often leads to incomplete study of the urine, with consequent failure to demonstrate the organisms. Some of the cases here recorded were said to show negative urines by virtue of that error. Subsequent stain of the suspected sediment in these instances revealed the organism.

Secondary invasion of the urinary tract in coccal infections has been long observed and commented on. Rovsing,[4] Clarke [26] and Maxwell [27] as early as 1898 attempted to solve this problem. Their investigations were not rewarded by positive conclusions, though in general they all felt that the coccus so lowered the resistance of the urinary tract that Bacillus coli found a favorable soil for invasion. This view has been shared by many subsequent writers. Chown [22] suggested that the kidney, in overcoming the primary invader, lays itself open to attack by the secondary invader. Bumpus and Meisser [14] have tended toward this view. Helmholz and Millikin [28] conducted animal experiments in which they first produced staphylococcal infections but failed in every instance to produce secondary invasion of the kidney with B. coli. In our series, secondary invasion by the colon bacillus occurred in seventeen instances, appearing from about the seventh to the tenth day and tending to persist longer than the primary invader. With the invasion of the colon bacillus, pus cells always appeared in the urine.

In this series the urine became free from signs of infection on the seventh day in the most favorable instance, the longest being 120, with an average of 35 days.

DIAGNOSIS

Ordinarily, the clinical diagnosis is arrived at without difficulty or delay, except in those rare cases of doubt in which the urine fails to show the cocci for the first few days. In these instances costovertebral tenderness is the most important observation.

Differentiation in atypical cases is sometimes difficult. The lesion most commonly confused is acute appendicitis. The absence of nausea and vomiting and of muscle spasm, with the presence of costovertebral tenderness and high leukocytosis, generally suffices to make the differentiation, even though cocci have not yet appeared in the urine. The tenderness in the right lower quadrant sometimes seen in these patients is probably due to some degree of inflammation of the ureter. This is ordinarily not accompanied by any muscle spasm.

Acute hydronephrosis must be ruled out in some instances. Four of our patients (8, 18, 25, 31) complained of extremely severe renal pain simulating colic and suggesting acute obstruction of the upper urinary tract. Ureter catheterization and roentgen studies were utilized in these instances to establish the diagnosis.

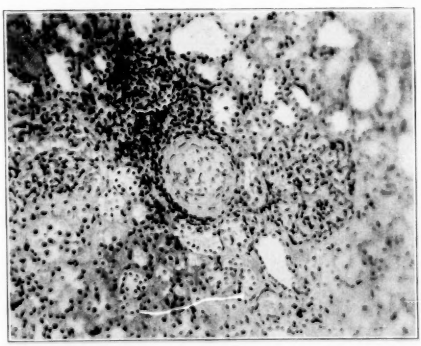

Fig. 3.—Moderate healing. Advanced scarring of glomerulus and thickening of its capsule.

Acute cholecystitis at times offers a difficult differentiation. For example, patient 44, a graduate nurse, was admitted during an attack of excruciating pain in the right upper quadrant, radiating to the back, with associated nausea and vomiting. She was in an extremely toxic condition, having a temperature of

24. Helmholz, H. F.: Personal communication to the author.
25. Hadley, P. B.: Personal communication to the author.
26. Clarke: A Discussion on the Origin, Effects and Treatment of Septic Infections of the Urinary Tract, Brit. M. J., 1898.
27. Maxwell, J. L., and Clarke, W. B.: The Relation of Bacillus Coli to Other Organisms in the Urine, Brit. M. J. **2**: 1472, 1899.

28. Helmholz, H. F., and Millikin, Frances: The Relation of Infections of the Upper Respiratory Tract to Pyelitis, J. A. M. A. **81**: 1160 (Oct. 6) 1923.

103 F. There were two severe chills. No urinary symptoms were noted. Examination showed spasm in the right upper quadrant and exquisite tenderness. There was also acute right costovertebral tenderness. The leukocytosis went from 11,000 to 33,000 in forty-eight hours, with a corresponding increase in the severity of symptoms. The urine was repeatedly found to be negative to all tests. Although coccus kidney was strongly suspected, acute empyema of the gallbladder could not be ruled out, and a laparotomy was performed at the beginning of the third day. All abdominal viscera were found to be normal. The kidney was enlarged to palpation through the peritoneum. On the second postoperative day, showers of cocci appeared in the urine, confirming the diagnosis of coccus kidney made in the operating room. The symptoms and signs

Analysis of Forty-Eight Cases of Acute Staphylococcal Kidney Infection

No.; Sex*; Age	Side	Etiology	Onset	Costo-vertebral	Highest Temperature	Bladder Symptoms	Leukocytosis	Urine						Duration of Abnormal Urine, Days	Duration of Symptoms, Days	Comments
								Cocci	Appeared, Day	B. Coli	Appeared, Day	Pus	Red Blood Cells	Albumin		
1 ♀, 20	R	Tonsillitis	Abrupt	Pain, tenderness	101	—	21,000	++	1st	—	—	—	—	—	22	6	
2 ♂, 10	R	Paronychia	Abrupt	Pain, tenderness, chills	103	—	15,000	++	1st	—	—	+	—	—	15	10	
3 ♀, 28	R	Defloration	Abrupt	Chills	?	+	.....	+	1st	+	10th	+	—	—	45	30	
4 ♀, 19	R	Defloration	Abrupt	Pain, tenderness, chills	105	+	18,000	++++	1st	—	—	—	++++	++	21	14	Subsequent pregnancy, normal urine
5 ♂, 36	R	Catheter chill	Abrupt	Pain, tenderness, chills	102	—	11,000	+	1st	—	—	—	—	—	10	10	Drainage of cortical abscess, complete recovery
6 ♂, 28	L	Upper respiratory tract	Abrupt	Pain, tenderness	100	—	11,000	+++	1st	—	—	—	++++	++	19	3	
7 ♂, 22	R	Upper respiratory tract	Abrupt	Pain, tenderness	...	+	.....	++++	3d	—	—	+++	—	—	15	8	
8 ♂, 21	R	.....	Abrupt	Pain, tenderness, chills	100	—	12,000	++	4th	—	—	—	++++	++	14	6	Renal colic, cystoscopic and x-ray examinations neg.
9 ♂, 38	L	.....	Abrupt	Pain, tenderness, chills	...	+	.....	+++	1st	—	—	+++	—	—	90	15	
10 ♂, 30	L	Tooth extracted	Abrupt	Pain, tenderness	...	+	.....	+++	1st	—	—	+++	++++	++	21	19	
11 ♀, 20	L	Tooth extracted	Abrupt	Pain, tenderness	101	+	.....	+++	1st	++	12th	—	—	—	23	10	
12 ♂, 56	R	.....	Abrupt	Pain, tenderness, chills	103	..	24,000	++++	1st	—	—	++++	++	++	..	..	Died twelfth day
13 ♂, 21	R	.....	Abrupt	Pain, tenderness, chills	105	+	18,000	+++	1st	—	—	—	—	—	120	..	Drainage of small perinephritic abscess 15th day; cured
14 ♂, 20	L	Boil	Abrupt	Pain, tenderness, chills	104	—	20,000	+++	1st	++	6th	++	—	—	18	15	
15 ♂, 14	L	.....	.....	Pain, tenderness, chills	105	—	14,000	+++	1st	—	—	—	—	+	35	45	Early diagnosis empyema; dry chest tap
16 ♂, 30	R-L	Upper respiratory tract	Abrupt	Pain, tenderness, chills	...	+	.....	++++	1st	—	—	—	—	—	14	35	
17 ♀, 26	L	Tonsillitis	Abrupt	Pain, tenderness	103	+	14,000	++	3d	—	—	—	—	—	12	10	
18 ♀, 17	R	Tonsillitis	Abrupt	Pain, tenderness, chills	100	—	9,200	+++	1st	++	5th	—	—	+	20	7	Renal colic, cystoscopic and x-ray examinations neg.
19 ♂, 56	L	Tonsillitis	Abrupt	Pain, tenderness, chills	101	+	.....	++	1st	—	—	—	—	—	5	3	
20 ♀, 25	R	.....	Abrupt	Pain, tenderness	99.6	+	.....	+++	1st	—	—	++	—	—	30	14	
21 ♂, 49	R-L	.....	Gradual	Pain, tenderness, chills	102	+	10,000	++++	1st	—	—	—	—	+	60	21	
22 ♀, 44	R-L	Wound infection	Abrupt	Pain, tenderness, chills	103	+	19,000	+++	1st	+++	7th	+++	—	+	120	55	Bilateral, severe; complete recovery
23 ♂, 35	R	.....	Abrupt	Pain, tenderness, chills	102	+	12,000	++	4th	++	10th	++	—	—	30	24	
24 ♀, 55	R	Chronic empyema	Abrupt	Pain, tenderness, chills	104	—	11,000	++	1st	+++	10th	+++	—	—	Cocci, 15 B. coli, 120	..	
25 ♂, 18	L	Upper respiratory tract	Abrupt	Pain, tenderness, chills	104	+	20,000	+++	1st	+	18th	—	—	—	24	18	Renal colic, cystoscopic and x-ray examinations neg.
26 ♂, 4	L	Otitis media	Abrupt	Pain, tenderness, chills	103	—	19,000	+++	1st	—	—	—	—	—	25	17	

* In this column, ♂ denotes male; ♀, female.

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Analysis of Forty-Eight Cases of Acute Staphylococcal Kidney Infection—Continued

No.; Sex; Age	Side	Etiology	Onset	Costo-vertebral	Highest Temperature	Bladder Symptoms	Leukocytosis	Urine						Duration of Abnormal Urine, Days	Duration of Symptoms, Days	Comments
								Cocci	Appeared, Day	B. Coli	Appeared, Day	Pus	Red Blood Cells	Albumin			
27 ♀, 25	R	Defloration	Abrupt	Pain, tenderness, chills	103	+	13,500	++++	1st	++	10th	++	++++	+++	Cocci, 20 Bac. 30	12	Onset with total hematuria
28 ♀, 27	R	Tonsillitis	Abrupt	Pain, tenderness, chills	102	—	10,000	++	1st	++	10th	+	—	—	Cocci, 18 B. coli, 90	5	
29 ♂, 18	L	Upper respiratory tract	Abrupt	Pain, tenderness, chills	101	+	15,000	+++	1st	—	—	—	—	—	15	15	
30 ♂, 43	R	.....	Abrupt	Pain, tenderness, chills	104	+	14,000	+++	1st	—	—	—	—	—	11	7	
31 ♂, 21	R	.....	Abrupt	Pain, tenderness	101	—	19,000	++	1st	—	—	—	+++	—	7	7	Renal colic, cystoscopic and x-ray examinations neg.
32 ♂, 20	R-L	Sinusitis	Abrupt	Pain, tenderness	99.6	—	.....	++	1st	—	—	—	—	—	10	3	
33 ♂, 18	R	Catheter chill	Abrupt	Pain, tenderness, chills	104	+	12,500	++++	1st	++	10th	+++	—	—	Cocci, 21 Bac. 40	10	
34 ♀, 22	R	.....	Gradual	Pain, tenderness	99.2	+	12,600	+++	1st	—	—	—	—	+	24	10	
35 ♀, 17	R-L	Upper respiratory tract	Abrupt	Pain, tenderness	101	—	11,600	+++	1st	—	—	++	—	+	35	19	
36 ♀, 23	R	Boil	Abrupt	Pain, tenderness, chills	103	+	32,000	+++	1st	++	3d	++	—	—	Cocci, 5 Bac. 25	4	
37 ♀, 26	R	.....	Abrupt	Pain, tenderness, chills	103.6	+	13,800	+++	1st	++	16th	+++	—	++	Cocci, 18 Bac. 16	19	
38 ♂, 18	R	Fistula-ano	Abrupt	Pain, tenderness, chills	100	+	14,000	+++	1st	+++	5th	+++	+++	++	Cocci, 14 Bac. 30	15	
39 ♂, 27	R	Catheter chill	Abrupt	Pain, tenderness, chills	104	—	14,000	++	1st	—	—	—	—	—	10	5	
40 ♂, 18	R	Boil	Abrupt	Pain, tenderness, chills	103	—	25,000	++	10th	—	—	—	—	—	21	27	Drainage of perinephritic abscess 16th day; complete recovery
41 ♀, 28	R	Boil	Abrupt	Pain, tenderness, chills	102	—	20,000	+	1st	—	—	—	—	—	21	30	Drainage of perinephritic abscess 18th day; complete recovery
42 ♂, 43	R	Boil	Abrupt	Pain, tenderness, chills	103	+	14,000	+++	1st	—	—	—	—	—	16	13	
43 ♂, 14	R	.....	Gradual	Pain, tenderness	102	+	22,000	++	4th	—	—	—	—	—	20	9	
44 ♀, 22	R	Upper respiratory tract	Abrupt	Pain, tenderness, chills	104	—	33,000	+	1st	++	14th	++	—	—	25	16	? empyema gallbladder laparotomy, abdomen negative, complete recovery in 25 days
45 ♂, 15	L	Osteo.	Abrupt	Pain, tenderness,	102	—	17,000	+++	1st	—	—	—	—	—	15	8	
46 ♂, 21	R	.....	Abrupt	Pain, tenderness, chills	?	—	?	+++	1st	—	—	—	+++	++	14	10	
47 ♂, 22	R	Trauma, right costo-vertebral	Abrupt	Pain, tenderness, chills	103	—	14,000	+++	1st	+	9th	+	—	—	21	..	Drainage of perinephritic abscess 8th day
48 ♂, 16	R	Upper respiratory tract	Abrupt	Pain, tenderness	100	—	10,400	++	1st	++	6th	++	—	—	16	—	

had all cleared up by the fourteenth postoperative day, although the urine showed organisms for approximately a month.

COMPLICATIONS

The relationship of coccus kidney to perinephric suppuration has long been recognized. Richardson,[29] Braasch,[30] Mayo,[31] Gibney,[32] Townsend[33] and many others have regarded these kidney infections as the most common cause. This complication arose four times in the forty-eight cases treated at the University Hospital. Other cases of perinephric abscess were of course observed and treated during this period but obviously should not be included in this series. The onset of this complication is heralded by a definite increase in intensity of symptoms and signs, especially local pain and tenderness, and is associated with an increase in temperature as well as leukocytosis. The diagnosis is rarely difficult in cases in which its onset is watched for carefully.

So-called carbuncle of the kidney is a complication which I feel is extremely rare, although many isolated

29. Richardson, E. P.: Perinephritic Abscess, Surg. Gynec. Obst. **21**: 1, 1915.
30. Braasch, W. F.: Perinephritic Abscess, California State J. Med. **14**: 15 (Jan.) 1916.
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cases have been reported in the literature.[34] Aside from the extreme rarity of this lesion, its diagnosis when it does occur should, I feel, offer little difficulty. The severity of symptoms should invariably indicate a situation demanding surgical relief. Beer [35] has described a few very unusual instances of this type, however, which have been silent so far as acute symptoms and signs are concerned. It is of interest and, I believe, of diagnostic importance that practically every case of carbuncle of the kidney reported in the literature presented a history of from three to nine weeks' illness prior to diagnosis and operation. In practically every instance a coexisting perinephric abscess was found. One is led to speculate as to whether early diagnosis and drainage of the perinephric abscess might not in many instances have prevented the widespread renal suppuration that was found. Habein,[36] in commenting on a series of forty-three cases of perinephric abscess observed at the Mayo Clinic, pointed out the importance of early diagnosis and treatment to prevent renal destruction and general sepsis. In the series mentioned, the average duration of symptoms before diagnosis was from five to six weeks.

COURSE OF THE DISEASE

Characteristically, staphylococcal infections of the kidney run a stormy course for the first week, followed by marked improvement of all symptoms and signs. Usually by the fourteenth day the temperature has come to normal and the patient is free from pain. Secondary invasion of the urinary tract by B. coli, when it does occur, usually takes place in the second week and generally produces some degree of bladder irritation or intensifies any preexisting urinary symptoms. Some patients show a slight recurrence of fever on being allowed up after their symptoms have disappeared. This rise is always a transient one, passing off in from twenty-four to forty-eight hours. In this series the average duration of symptoms was 14.4 days. When the lesion fails to run a satisfactory course in a reasonable period of time, one of the complications must be suspected. Of special significance in this regard is any marked accentuation of any of the symptoms or signs.

The uncomplicated cases apparently end in complete recovery, except for the undoubted glomerular scars, which probably have no importance so far as renal function is concerned.

One of our cases, showing a bilateral fulminating infection, terminated fatally. Postmortem examination revealed only suppurative lesions of microscopic dimensions.

In the cases here reported, it is of interest to note that in no instance did the acute staphylococcal infection become chronic, a point stressed by Hellström [5] in analyzing his series of thirty acute cases. On the other hand, in eighty cases of chronic staphylococcal infections he found that the onset was almost invariably insidious. Our observations made on a considerable number of the same type not here reported have tended to substantiate his views.

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TREATMENT

Most of the earlier writers on the subject have advocated and practiced various operative procedures designed to drain the cortical abscesses, to prevent widespread renal sepsis or even to save life. The operations advised have consisted of some form of drainage of the suppurating areas, by puncture, incision or excision generally with decapsulation. Nephrectomy has also been advocated. Many, however, have reserved this for desperate cases.[37]

In our management of these patients, we have consistently followed a conservative course, considering the disease to be one which tends to run a self-limiting though stormy course within a relatively short period of time in the vast majority of cases. In uncomplicated cases, patients with surprisingly serious infections recover without operation quite rapidly.

In one of our cases surgical drainage of three small cortical abscesses was performed, the preoperative diagnosis being perinephric abscess. Recovery was prompt and complete. In retrospect we doubted the value of the operation, feeling, as Bugbee [19] did in an identical situation, that the patient would undoubtedly have recovered spontaneously.

Our patients were kept in bed during the febrile period, fluids were forced, and the diet was regulated by the patient's desires. Various medications were given orally in most cases but have not clearly demonstrated their worth.

Complications should be treated surgically without delay. The only one occurring in this series was perinephric abscess, occurring four times and representing an incidence of 8.3 per cent. In each instance the diagnosis was promptly made and surgical drainage was instituted with rapid recovery.

SUMMARY

1. Acute staphylococcal infections of the kidney are relatively common.

2. They are hematogenous in origin, a recognizable focus generally being present.

3. The parenchymatous lesion is characteristically cortical in its location and shows a marked tendency to heal promptly and completely.

4. Costovertebral pain and tenderness are constant.

5. Examination of the stained urinary sediment is essential in all suspected cases.

6. The disease tends to run a stormy though self-limiting course, ending in complete recovery.

7. Surgical treatment should be employed only in cases in which complications develop, of which perinephric abscess is the most common.

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The Abnormalities of Human Beings.—As doctors, our thoughts and energies are concentrated on the abnormalities of human beings. There is no separation of man from his disease or of disease from man. The two are part and parcel of a single unit which needs some further definition for our purposes. What we recognize and classify as a disease picture is, in reality, the kaleidoscopic reactions of a man to some injury. This injury may take the form of invasion of the body by bacteria, the disturbance of the specific function of some organ (diabetes, Graves' disease), or a mechanical defect such as occurs in heart disease.—Longcope, W. T.: Methods and Medicine, *Bull. Johns Hopkins Hosp.* **50**:4 (Jan.) 1932.

INFECTIONS IN THE GENITO-URINARY TRACT, AND COMPLICATIONS

FURTHER ADVANCES IN THE TREATMENT*

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The treatment of infections of the genito-urinary tract depends so much on the type of bacterium which is causing the infection that it seems important to present briefly summaries of the bacteriologic observations from a consecutive series of our cases of bladder, kidney and blood stream infections.

INCIDENCE OF INFECTION

Bladder Infections.—A summary of the observations in a series of 600 cases of bladder infection shows that 351 cases, 58.7 per cent of the series, were infected with colon group organisms, 253 of which were obtained in pure culture. The staphylococci and micrococci were found in 265 cases, in pure culture in 122. After these two big groups there is a rapid drop in incidence. Streptococci were found in 67 cases, 30 of them in pure culture. Although found comparatively seldom, the remaining organisms are by no means unimportant on that account. Among them may be cited Proteus, found in 43 cases, 17 times in pure culture; B. pyocyaneus found in 28 cases, 16 times in pure culture; 6 cases of infection with organisms of the paratyphoid group; 5 cases of infection with organisms of the dysentery group, and 3 of the typhoid group.

Renal Infections.—A review of eighty-two renal cultures covering the same period showed a general parallelism to the bladder series, with certain exceptions. Thus the incidence of colon group infections is lower in the kidney than in the bladder; that of the streptococci is the same. Both Proteus and B. pyocyaneus show higher incidence in the kidney than in the bladder. The same is strikingly true of Staphylococcus aureus, and of the organisms of the paratyphoid group. Certainly the presence of Proteus or of B. pyocyaneus or of the many interesting intermediates of the typhoid-paratyphoid-dysentery groups is not to be regarded lightly.

Blood Stream Infections.—An analysis of 203 cases of blood stream invasion in our cases shows the following incidence: There were 104 cases of colon group invasion, after which there was a great drop, to 27 by members of the staphylococcus or micrococcus groups, 18 Proteus, 9 by members of the typhoid group, 7 by B. pyocyaneus, 5 by the paratyphoid group, 4 by beta streptococci (hemolytic), 4 by gamma streptococci, and 25 in which two organisms were found.

In a previous paper[1] the point was made that in differentiating colon group bacilli, whereas the number of organisms of the B. lactis-aerogenes group (genus Aerobacter) in the intestine is low, varying according to different observers from zero to not more than 26 per cent, in the urine, in a series of 200 cases, the incidence of this organism was about 40 per cent. In the blood the incidence is about 75 per cent of the colon group invasions.

Among the general considerations of interest in the treatment of infection is the problem of the difference of resistance of different bacterial genera to drug action. Thus even among the colon bacilli group there is a striking difference in the inhibitory action of drugs on the two main subdivisions; that is, the organisms most closely related to B. coli, or the genus Escherichia and the organisms of the B. lactis-aerogenes group, or the genus Aerobacter. The accompanying table shows how striking is the difference in action of powerful drugs in their action on these two main groups. B. pyocyaneus has proved by far the most resistant vegetative organism that we have tested. It is wise to determine these general facts before drawing conclusions about any one drug.

Proteus Infections.—Cases of Proteus infection, although less numerous than the coccal or colon group infections, are often of extreme importance. It has been noted that the mortality of Proteus blood stream invasions is 55 per cent. The organism is also the cause of very serious damage in operative wounds, which are usually accompanied by a certain amount of general sepsis. Such Proteus infections not only greatly retard the healing processes but may be associated with very serious systemic and general symptoms. The same applies to infections with B. pyocyaneus and B. thompsoni. The treatment of the open wound and bladder which have become infected with these alkalizing bacilli has shown at our clinic that they are best combated by an active use of irrigations or injections of 1 per cent solution of acetic acid, at the same time giving acidifying drugs by mouth, acid sodium phosphate and the like.

Concentrations of Drugs Invariably Inhibiting Growth in Broth

Drug	Escherichia	Aerobacter
Mercuric chloride	1:500,000	1:30,000
Meroxyl	1:300,000	1:20,000
Merthiolate	1:900,000	1:400,000
Metaphen	1:300,000	1:10,000
Potassium mercuric iodide	1:200,000	1:70,000

THERAPEUSIS

The difficulty of completely eradicating infections of the genito-urinary tract is due to the fact that the bacteria have usually penetrated so deeply that local treatment, whether of the urethra, bladder or kidney pelvis, usually fails to reach the depths of the infection. Although numerous new germicides have been produced, the problem still remains of how best to eradicate deep seated foci of infection.

For many years internal therapeusis by oral administration of drugs has been used, sometimes effectively; but, as a whole, this method has failed. With the development of intravenous chemotherapy, protein and serum therapy, both specific and nonspecific, and shock therapy, much has been accomplished. But, owing to the great difficulty of correctly interpreting results and of evaluating the effect that may be attributed to the treatment, it is often difficult to state positively just what has been and can be accomplished by the different types of therapy. In spite of these great difficulties, we will describe certain methods employed in the treatment of various types of genito-urinary infection, attempt to analyze the results, and draw conclusions as to the efficacy of the treatment.

* From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital.
* Read before the Section on Urology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.
1. Hill, J. H.; Seidman, L. R.; Stadnichenko, A. M. S., and Ellis, M. G.: J. Bacteriol. 27: 205 (March) 1929.

Gonococcus Infections.—These represent a notably difficult therapeutic problem. Whereas a certain percentage of patients with acute gonorrhea are cured or spontaneously get well by simple local or internal therapy, it is well known that in a large proportion of the cases the organisms penetrate deeply into the glands remote from the urinary passages, where they may remain for indefinite periods. The problem here is, from the very beginning, to reach the bacteria which so rapidly penetrate first into the glands along the urethra and then the deeper glands of the bulb, the prostate, the seminal vesicles and not infrequently the epididymides, the blood stream, the joints, and even the heart. Even in the simplest cases of anterior urethritis, the gonococcus is generally to be found in the periurethral glands too distant to be reached by local injections, and, although the deeper organs may never be reached, the infection may remain chronic for many months or years. Consideration of these facts led us to use a combination of local and intravenous therapy, even in cases in which the infection was only a few hours or a day or two old, and we are thoroughly convinced, after a considerable series of cases, that far better and quicker results are obtained by a combination of local antiseptic therapy, injections and irrigations, and intravenous therapy, with mercurochrome-220 soluble or neoarsphenamine, alone or in combination with protein therapy, than we have ever been able to accomplish by local treatment alone.

We are presenting herewith the histories in brief abstract of fourteen cases of acute and chronic gonorrhea, many with complications, to show what may be accomplished in some cases by intravenous mercurochrome. The diagnosis of the gonococcus was always made by the Gram stain or by culture. All the patients received local treatment for urethritis consisting of injections of mild silver protein, strong silver protein, mercurochrome or intravesical irrigations of permanganate or meroxyl in addition to intravenous injections of 1 per cent mercurochrome in doses stated, over a given time. Lack of space prevents giving many details, but all important facts have been noted. In no case were the reactions very severe, nor was there any resultant nephritis or enteritis; the statement may therefore be accepted for each case that the intravenous therapy did no harm. The splendid results obtained speak for themselves. The failures are given in the summary of results.

CASE 1.—*Acute gonococcus urethritis.*

W. N. B., a man, aged 32, admitted Nov. 12, 1929, had a urethral discharge of twelve days' duration. The first glass of urine was very cloudy. The prostate and the seminal vesicles were normal. Injections of 13, 15, 18 and 20 cc. of 1 per cent mercurochrome were given intravenously during a period of ten days. Anterior injections of 1 per cent strong silver protein and bladder irrigations of acriflavine hydrochloride, 1:4,000, were given. Two days after the first injection the discharge had almost completely disappeared, and within a week there was no urethral discharge, and the smear showed no organisms. The urine was clear. Slide smears from the urethra, November 15 and 21, and December 3 and 12 showed no gonococci. The urine was clear, with no shreds, and microscopically negative. The prostate was normal. He was seen again, January 17; he had remained well. Examination was negative.

CASE 2.—*Gonococcus urethritis of two months' duration.*

J. A. B., a man, aged 25, admitted, June 15, 1929, had a urethral discharge of two months' duration. Examination showed purulent discharge with gonococci. The prostate was normal. Mercurochrome, 1 per cent, was given intravenously in two injections of 13 and 18 cc. at an interval of three days. There was no marked reaction. After the second injection there was no discharge; the urine showed no shreds and was microscopically negative. The patient received in addition acriflavine hydrochloride 1:4,000, as anterior injections, and also potassium permanganate 1:6,000. The patient was discharged apparently well on the twelfth day.

CASE 3.—*Gonococcus urethritis of three months' duration.*

J. B., a man, aged 37, admitted, June 9, 1927, had urethritis of three months' duration. He had had gonorrhea fifteen years previously. Numerous gonococci were found on smear and culture. Mercurochrome 1 per cent was given intravenously three times, in 15, 18 and 20 cc. doses, with intervals of two and eight days. The urethral discharge became scanty, and gonococci were not found on the day after the first injection. Negative smears and cultures were made, June 13, 15 and 20. The patient was discharged, apparently well, June 20.

CASE 4.—*Chronic gonococcus urethritis and prostatitis of four months' duration.*

R. C. H., a man, aged 37, admitted, March 2, 1929, had a discharge of four months' duration. He had had gonorrhea fifteen years before. The discharge was not profuse; it contained a small number of gram-negative intracellular diplococci and gram-positive diplococci. Culture was negative for gonococci and positive for the gram-positive diplococcus. The diagnosis was subacute prostatitis and acute epididymitis. Urethral injections and intravenous injections of 1 per cent mercurochrome, in 12, 15 and 18 cc. doses were given with intervals of two and four days. There was improvement in the infection and rapid reduction in the size of the prostate. Slide smears from the urethra were negative, March 8, 9 and 13. The patient was discharged, March 14; there was no urethral discharge. Urine cultures were sterile; the prostate was small and slightly indurated. He returned four months later; there was no urethral discharge; the prostate was normal in size; the seminal vesicles were slightly indurated; the urine was clear, with no shreds, and cultures were sterile.

CASE 5.—*Gonococcal urethritis, prostatitis.*

H. S. B., a man, aged 25, admitted, Feb. 4, 1925, had had urethritis for three months. There was a profuse urethral discharge. Gonococci were present. The prostate was enlarged, indurated and moderately tender. The prostatic secretion showed many pus cells. Urethral injections of meroxyl and strong silver protein were given. The urethritis persisted. Gonococci were present, February 21. He received intravenous mercurochrome, 1 per cent, twice, 14 cc. February 23, 19 cc. three days later. Following this he was entirely free from symptoms, except for an occasional mucoid urethral discharge, which contained no gonococci. March 5, the prostate was smaller than on admission. There were no urinary symptoms. No gonococci were found. There were a few shreds in the urine.

CASE 6.—*Acute anterior gonococcus urethritis, superimposed on old prostatitis.*

J. H., a man, aged 23, admitted, Nov. 29, 1924, had had gonorrhea seven years before, and urethritis for one week. He had a pronounced urethral discharge; gonococci were present. Pus was found in the first glass of urine. The prostate was slightly enlarged; the seminal vesicles were normal. Injections of mercurochrome, 1 per cent, intravenously, in 30, 30 and 20 cc. doses, were made during two weeks. There was no marked reaction. There was a prompt disappearance of gonococci. None were found in urethral smears, December 2, 6 and 13 or later. Local treatment with a number of drugs was given. The patient was followed for two months, during which prostatic massage was given for chronic prostatitis. Slide and cultures were negative for gonococci. He was discharged well.

CASE 7.—*Gonococcus urethritis of seven months' duration. Old prostatitis and cystitis.*

W. E. O., admitted, Nov. 17, 1930, had had gonorrhea of three months' duration eight years before admission. He had a urethral discharge seven months before admission. Bilateral vasotomy and injection of seminal vesicles were done five months before. On admission the urethral discharge contained gonococci, which were also present in the urine and the prostatic

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secretion. Urethral injections were given and mercurochrome, 1 per cent intravenously, in 13, 15, 18 and 17 cc. doses over a period of two weeks. No urethral discharge and no gonococci were found, November 20, 21 and 26, and December 1. The prostatic secretion contained pus but no organisms. The reactions from the mercurochrome were slight. Urine cultures on discharge showed no gonococci.

CASE 8.—*Acute anterior and posterior gonococcus urethritis and prostatitis.*

C. B. M., a man, aged 63, admitted, Sept. 20, 1929, with acute gonorrhea of two weeks' duration, had a profuse urethral discharge with numerous gonococci. The prostate was enlarged and very tender. The temperature ranged from 103 to 105 F. Urethral injections and intravenous injections of mercurochrome, 1 per cent, were given in 12, 15, 18 and 20 cc. doses in eleven days. The reactions were slight. After the third injection there was no urethral discharge. Urethral smears, October 9 and 11, were negative for gonococci, and the prostatic swelling was markedly diminished and less tender. At the end of six weeks, the patient, who had received prostatic massage, was discharged in excellent condition. The urine was clear, only a few shreds being found in the first glass. The prostate was markedly smaller. No gonococci were present. There was no urethral discharge. When the patient was seen six months later the urine was clear and free from infection. The prostatic secretion still contained leukocytes but no gonococci.

CASE 9.—*Chronic prostatitis; acute gonococcus urethritis; prostatitis.*

L. R. B., a man, aged 31, admitted, May 9, 1929, had gonorrhea of five weeks' duration. There was a profuse urethral discharge; gonococci were numerous; cultures were positive. The prostate and the vesicles were involved. Urethral injections of mild silver protein and meroxyl were made. Three intravenous injections of 1 per cent mercurochrome were made in 13, 15 and 18 cc. doses in ten days. The reaction was slight. Gonococci disappeared after the first injection and did not return. Slide smears, May 16 and 24, were negative. Treatment for chronic prostatitis was begun and continued for three weeks with improvement. There was no return of the gonococci. He was discharged from the clinic, July 5. The prostatitis was markedly improved. No gonococci had been found on numerous examinations since May 11. Three months later an examination showed no recurrence.

CASE 10.—*Acute gonococcus urethritis; epididymitis of three months' duration.*

W. B. S., a man, aged 45, was admitted, Nov. 19, 1928, with gonorrhea of six months' duration. The urethral discharge contained numerous gonococci on slide smear and culture. The right epididymis was enlarged and tender. The prostate and vesicles were apparently normal. Urethral injections were made; intravenous injections of mercurochrome, 1 per cent, in 8, 15, 15 and 20 cc. doses were given in seven days. There was only one pronounced reaction. November 23, a direct smear from the urethra showed no organisms. No gonococci and only a few gram-positive cocci were found on culture. During the next three weeks the patient received local treatment and on two examinations showed no gonococci. He was discharged, December 6; there was no urethral discharge; the prostatic secretion was sterile; the epididymis was "cleared up," and urination was normal.

CASE 11.—*Acute gonococcus urethritis of four months' duration. Epididymitis, slight prostatitis and seminal vesiculitis.*

S. G., a man, aged 28, admitted, Oct. 9, 1925, was referred by a prominent urologist, who stated: "The patient has been under treatment for four months for very intractable neisserian infection." One month before he had developed epididymitis. There was a profuse urethral discharge; gonococci were present on examination. There was bilateral epididymitis, moderate and subacute. The prostate was slightly indurated and enlarged. The right seminal vesicle was slightly indurated. Local urethral injections were given. Three intravenous injections of mercurochrome, 1 per cent, 21 cc. each, were given within a week. There was very little reaction. There was however, a pronounced effect on infection. No gonococci were found after the second injection. The patient was examined at various times over a period of six months but showed no return of gonococcus infection.

CASE 12.—*Acute gonococcus urethritis and epididymitis superimposed on chronic prostatitis.*

E. W., a man, aged 23, admitted, Dec. 20, 1927, with gonorrhea of five weeks' duration, had had gonorrhea three years before. There was a profuse urethral discharge with numerous gonococci and acute epididymitis. Urethral injections were given and mercurochrome, 1 per cent, intravenously, six injections, consisting of 15, 20, 20, 22, 20 and 15 cc. over a period of seven weeks. Gonococci were not found after the fourth injection, December 29. Treatment was continued for chronic prostatitis until Feb. 10, 1928. Numerous examinations showed no gonococci, but the prostatic secretion contained leukocytes. Cultures were negative.

CASE 13.—*Acute gonococcus urethritis, prostatitis and arthritis.*

G. A. W., admitted, June 16, 1924, had had recurrent attacks of gonococcus urethritis for twenty years. He was brought into the hospital on a stretcher. He had arthritis of both knees. Both knee joints were acutely swollen. There was a profuse urethral discharge; gonococci were numerous. A culture of urine and prostatic secretion showed staphylococci. Urethral injections were given; mercurochrome 1 per cent, 28 cc., was given intravenously, July 24, and again, August 20. Three days after the first injection he had almost perfect function of the left knee, and the right was greatly improved. Cultures of the urine and the prostatic secretion were negative, July 26, 28, 31 and August 16. The patient was discharged, August 26, with complete function of both knees. There was no pain. There was no urethral discharge (slide cultures were negative), and the urine and prostatic secretions were normal.

CASE 14.—*Acute gonococcus urethritis and arthritis.*

M. J. R., a man, aged 25, admitted, June 15, 1929, had had gonococcus urethritis for three months and arthritis for three weeks. Gonococci were present. There was a very acute tenosynovitis with reddening of the skin in the region of the left elbow. The prostate and vesicles were normal. Urethral injections were given and mercurochrome 1 per cent, intravenously in two injections of 20 cc. each, four days apart. On the day after the first injection there was a marked improvement of the arthritis. June 20 there was no urethral discharge, and the urine was negative. The arthritis was greatly improved. No gonococci were found. The patient returned two years later. There has been no recurrence of urethritis or arthritis. Examination was negative. The patient had developed a stone in the kidney, which was removed successfully at operation by Dr. Colston.

Complicated Acute and Chronic Gonorrhea.—A study of seventy-one cases of complicated acute and chronic gonorrhea, in which mercurochrome was administered intravenously, in addition to urethral injections, or irrigations, as previously stated, shows prompt disappearance of gonococcus infection and urethral discharge in forty cases, or 55 per cent. The effect is described as strikingly rapid in twenty-nine of these cases and excellent in eleven. In the other thirty-one cases the results of the intravenous therapy may be described as probably helpful in five cases, of doubtful value in eighteen cases, and of no effect in eight cases. In eighteen of these cases, however, the treatment was not as complete as we would have wished, generally because of the patient's failure to return. The cases that are included in this list of seventy-one cases comprise urethritis with prostatitis, sixteen cases; with prostatitis and vesiculitis, ten cases; with epididymitis, fourteen cases; with acute gonorrheal arthritis, twenty-four cases. In the twenty-four cases of gonorrheal arthritis we have evidence of the often great value of intravenous injections of mercurochrome in the quick amelioration of the joint condition in all cases, and the complete cure of the gonorrhea and its complications in fifteen cases. In nine cases, 39 per cent, intravenous

injections of mercurochrome did not markedly hasten the result of treatment, and in three there was a complete failure.

Confirmation of our belief in the value of intravenous injections of mercurochrome in acute and chronic cases of gonococcus infection is to be found in a number of articles in the literature. Whitman,[2] after a study of a series of acute and chronic cases, says: "The rapid subsidence of symptoms in all, and the abrupt termination of symptoms in some cases was almost incredible to one accustomed to the usual slow methods of gonorrheal treatment." Potter [3] reported the results of intravenous injections of mercurochrome in twenty-four cases of acute gonorrheal urethritis, eight cases of chronic urethritis, eleven cases of acute gonorrheal prostatitis, six cases of gonorrheal epididymitis and seminal vesiculitis, and twenty-five cases of chronic prostatitis, from which he draws the following conclusions: "Mercurochrome-220 soluble is one of the most important new remedies for use in intravenous antiseptic medication. Acute rheumatism, synovitis, myalgia, neuritis, arthritis and other manifestations of absorption from the prostate and seminal vesicles, sites of local infection, will clear up rapidly on the intravenous administration of mercurochrome, as will also a large number of cases of gonorrheal urethritis, epididymitis, prostatitis and seminal vesiculitis." Walther,[4] in a report of 768 cases, said: "I am convinced that a large number of these patients were materially benefited by the dye intravenously, and that its employment appreciably shortened the duration of the infection." Williams and Small [5] report seventy cases of gonococcus infection treated with mercurochrome, together with sugar and foreign protein. Among these, twenty-two, or 31 per cent, were chronic gonorrheal infections, and ten, or 14 per cent, of the patients had had gonorrhea previously. The results obtained by the authors are stated to be: cases cured, thirty-nine, or 55 per cent, and cases apparently cured, but not followed as long as desirable, eleven, or 15 per cent. "Twenty cases were either improved or so recent that sufficient follow-up data are not yet available. All cases showed positive improvement. The average number of days between administration of mercurochrome and negative smears was 12.3 days. The almost immediate relief of pain is a striking characteristic, being particularly noted in the cases of acute epididymitis and cystitis."

Other reports on the use of mercurochrome intravenously in gonococcus infections are to be found in the literature, which has now become very voluminous, but we have mentioned these simply in confirmation of our steadfast belief in the great value of intravenous injections of mercurochrome as an aid in the treatment of both acute and chronic gonococcus infections and its complications. In practically all cases other treatment is necessary. We proved very early that intravenous injections of mercurochrome, or other drugs, did not cause a disappearance of organisms which were in the urethra, the lumen of which is not reached by the blood stream. In a series of cases in which no urethral injections were used, quick sterilization of the urethra was not obtained. By a combination of urethral injections to combat the gonococci in the urethra and chemotherapy to combat organisms which have penetrated deeply into the glands or tissues, a rational and often unusually effective method is presented for attacking this fearfully serious disease.

Infections of Urinary Tract Due to Bacteria Other than Gonococcus or Tubercle Bacilli.—As previously shown, a great variety of organisms are to be found as the infective agents in the lower and upper urinary passages, in the blood stream, and in organs secondarily invaded from the urinary tract. When these bacteria are localized to the bladder and urethra and are fairly acute in character, no great difficulty is experienced, as a rule, in getting rid of the infection, by means of simple antiseptic irrigations or injections, provided all obstruction to free urination is removed. Many such infections are self-limiting or autosterilizing by the simple natural processes. We not infrequently see cases after prostatectomy or vesical operation in which, under no treatment at all, the urine several months later is found to have become sterile. When, however, the process extends more deeply, involving the prostate and seminal vesicles, and particularly the renal cortex (pyelonephritis), it is rarely autosterilized. The cure of such pathologic processes is, indeed, not often obtained by local treatment (vesical or pelvic lavage). In some cases internal urinary antiseptics (methenamine, acriflavine hydrochloride, pyridium and caprokol) may be definitely helpful. Indeed, sometimes the alternate alkalization and acidifying of the urine may be peculiarly effective, but in many cases much more is necessary in order to accomplish results. It is here that intravenous chemotherapy and protein therapy promises much help.

The coccus infections have so far proved to be most easily eradicable by means of such methods; not infrequently many of the staphylococcus invasions of the kidney and bladder quickly disappear after intravenous injections of neoarsphenamine and also of mercurochrome. The following cases are given to show particularly the excellent results that may follow intravenous injections of neoarsphenamine:

CASE 15.—*Chronic prostatitis and seminal vesiculitis. Staphylococcus albus infection of urine.*

W. S., admitted, Nov. 19, 1928, with a diagnosis of chronic prostatitis and seminal vesiculitis, and of staphylococcus infection of the urine, had had gonorrhea twenty-five years before, and again four years before. The urine on admission was infected with Staphylococcus albus. Injections were made into the bladder, and prostatic massage was instituted. Because of the persistence of the coccal infection, the patient received neoarsphenamine, 0.4 Gm. intravenously, December 4. The urine, which had been heavily infected the day before, was sterile the day after this treatment, and thereafter on December 8 and 19. The patient was discharged well, December 20.

CASE 16.—*Congenital valve of posterior urethra, pyelitis of four years' duration. Staphylococci recovered from both kidneys.*

M. H., a boy, aged 6½ years, admitted, March 5, 1931, with pyelitis of four years' duration, had been treated internally. A congenital valve of the posterior urethra was discovered. The bladder urine was heavily infected with a staphylococcus, which was also found by ureteral catheter in both kidneys, March 10. On this date Dr. W. A. Frontz gave the patient 100 mg. of neoarsphenamine intravenously. The next day no organisms could be found in microscopic examinations of the urinary sediment, but there was a scant growth of the coccus after forty-eight hours of incubation. The urine two days later (March 13) was sterile.

CASE 17.—*Acute bilateral pyelitis due to Staphylococcus aureus.*

L. L., a woman, admitted, January 13, had had urinary frequency and pain on voiding for eight days, pain in the region of the right kidney for five days, and pain in the region of the left kidney for one day. Cultures from the bladder and both

2. Whitman, W. A.: Mercurochrome-220 Soluble Intravenously in Chronic Gonorrhea and Complications, J. A. M. A. **82**: 1914-1915 (June 14) 1924.
3. Potter, J. E.: U. S. Nav. M. Bull. **22**: 542 (May) 1925.
4. Walther, H. W. E.: New Orleans M. & S. J. **78**: 804-806 (June) 1926.
5. Williams, L. H., and Small, W. D.: U. S. Nav. M. Bull. **25**: 621 (July) 1927.

kidneys by catheterization showed an atypical Staphylococcus aureus. January 14, Dr. W. A. Frontz gave the patient neoarsphenamine, 0.45 Gm. intravenously. The urine, January 15, showed very few cocci and the growth was very scant. January 19, the urine was sterile. The patient was examined several months later; the urine was sterile.

CASE 18.—*Staphylococcus, pyelitis and chronic prostatitis.*

N. H., admitted, Nov. 9, 1928, had had gonorrhea eleven years and epididymitis three years previously. The left kidney was removed eight months before because of stones. After that he had repeated attacks of pain on the right side. Cultures of the urine from the right kidney, November 20 and 23, showed Staphylococcus albus. November 24 the patient was given 0.45 Gm. of neoarsphenamine. Forty-eight hours later the urine from the right kidney was sterile. The patient was discharged December 1, with sterile urine.

CASE 19.—*Chronic prostatitis; acute epididymitis; cystitis; urine cultures showing streptococcus.*

T. S., a man, aged 45, admitted, Dec. 21, 1930, had had hematuria, followed by epididymitis, ten months before. In September, a diagnosis of urethral stricture had been made and a sound passed. The patient entered the hospital with a right epididymitis. There was also a chronic prostatitis and purulent urine, the cultures showing a streptococcus. He received the following intravenous treatment: December 26, mercurochrome, 1 per cent, 12 cc., followed by a mild reaction, subjective improvement and slight softening of the epididymis. December 28, mercurochrome, 1 per cent, 15 cc., with no reaction. The epididymis became much softer and painless. January 1, 0.3 Gm. of neoarsphenamine was given. Epididymitis had subsided before this injection, which was given for the urinary infection. January 3, 0.3 Gm. of neoarsphenamine, and January 5, 0.45 Gm. of neoarsphenamine was given. January 7, 18 cc. of mercurochrome, 1 per cent, was given; the urine still showed coccus infection. January 9, urine cultures were sterile and continued so, but the patient was being treated for prostatitis by massage, and on January 14 a final injection of 14 cc. of mercurochrome, 1 per cent, intravenously was given. The patient was discharged January 24; the urine was sterile. The urine was again examined March 13; the cultures were sterile.

Bacillary Infections.—As shown before, the B. coli group form a large percentage of the bacteria found in infections of the bladder and kidney. Unfortunately, the bacilli are much more resistant to treatment than the cocci. In a good many cases the portal of entry is the intestinal tract, and much can be accomplished by colonic irrigations and other therapy directed to chronic infection of the gastro-intestinal tract. Internal antisepsis, as stated before, should always be tried and in some cases is distinctly effective. By alternating the drug and the method, occasionally surprisingly good results are obtained, but in the majority of cases a bacillary infection is very resistant to all forms of treatment. Local treatment, lavage of the bladder and renal pelvis with various antiseptics, is not infrequently successful, especially if alternation of drugs is carried out. For intravenous treatment one may use acriflavine hydrochloride, methenamine or mercurochrome. Each of these has been responsible for a certain number of fairly rapid sterilizations of the urine. That it is possible in some cases to get good results by the intravenous injection of mercurochrome, the following cases will show:

CASE 20.—*Bilateral pyelonephritis due to B. coli-communior. Septicemia following ureteral catheterization. Condition of patient desperate.*

H. A. D., a man, aged 44, admitted, Dec. 30, 1922, had pain in the kidney which was shown on examination to be due to bilateral pyelonephritis due to B. coli-communior. The urine from both kidneys contained the infection but very little pus. Following catheterization the patient developed septicemia and grew rapidly worse, the temperature ranging from 102 to 104.6 F. Blood cultures showed 140 colonies of B. coli to 1 cc. of blood. The patient grew rapidly worse; he became irrational. Medical consultants thought the case hopeless and that the patient would not live more than a few hours. He was given 34 cc. of mercurochrome, 1 per cent, intravenously. This was followed by a chill, a rise of temperature to 103.8 F. and a drop of 6 degrees in four hours. Blood cultures twelve hours after injection were sterile and remained so. The next day the patient felt greatly improved; the urine became sterile, cultures were negative, and he was discharged from the hospital apparently well in seven days. He was seen repeatedly afterward. The urine remained sterile.

CASE 21.—*Bilateral chronic pyelonephritis due to B. lactis-aerogenes.*

I. S. G., admitted, Jan. 2, 1923, had bilateral pyelonephritis shown by ureteral catheterization and cultures to be due to B. lactis-aerogenes. Pelvic lavage was done with silver nitrate, 1 per cent, and meroxyl, 1 per cent, unsuccessfully. January 12, mercurochrome, 1 per cent, was administered intravenously, 5 mg. per kilogram. The reaction was moderate. On the following day the urine was found to contain numerous bacilli (dead?), but cultures were sterile. Cultures on subsequent days showed urine still sterile and microscopically no bacteria were found.

CASE 22.—*Child with double pyelonephritis due to B. coli. Very septic. Condition bad.*

M. L., a girl, aged 4 years (a Harriet Lane Clinic case), admitted, Nov. 2, 1923, with pain in the right side had a temperature of 102.5 F. and marked tenderness over both kidneys. The urine was very cloudy. Cultures showed B. coli. Leukocytes numbered 19,950. The temperature the next day was 105 F. The patient was very ill. One hundred milligrams of mercurochrome, 1 per cent, was injected intravenously. On the following day the temperature was 98. The patient was greatly improved. There was a slight recurrence of fever, and four additional intravenous injections of mercurochrome, 30 mg. each, were given. The temperature remained normal after the seventh day. The patient felt well, but the urine still contained bacilli.

Combined Coccus and Bacillary Infection.—In cases in which there is a combined coccus and bacillary infection we have frequently employed, with excellent results, neoarsphenamine to eradicate the coccus infection and then mercurochrome to combat the bacillary infection. The following case is one of this type.

CASE 23.—*Bilateral pyelonephritis. Cultures of both bacilli and cocci.*

H. P. S., a man, aged 36, admitted, Jan. 12, 1923, had pain in the region of the kidneys, and hematuria. Ureteral catheterization showed pus cells and bacilli from both kidneys and cocci from the left kidney. Pelvic lavage was done intermittently without results until July 3, when he was given 0.3 Gm. of neoarsphenamine intravenously and ten days later another injection of 0.75 Gm. without reaction. Two days later cultures showed that the cocci had disappeared, but the bacilli were still present. July 13, the patient was given 30 cc. of mercurochrome, 1 per cent, intravenously, without reaction. Cultures, July 14, 16 and 17, were sterile. No organisms were found in the urine thereafter.

Fever.—Cases in which the presence of fever gives evidence of an infectious process somewhere may often be treated intravenously to advantage. In cases of prostatic hypertrophy, fever, coming on during the period of preparation, may be due to a periurethral, a periprostatic or a renal infection. The patient often becomes septic, with intermittent chills and fever without physical signs to indicate positively where the focus of infection lies. In such cases we have for a long time employed intravenous therapy with some excellent results. The following case is one of this type:

CASE 24.—*Fever and marked evidence of sepsis following prostatectomy. Probable left pyelonephritis.*

J. B. B., a man, aged 61, was admitted, Feb. 26, 1925, with benign prostatic hypertrophy. The urine was infected with

both cocci and bacilli. Perineal prostatectomy was done, March 2; convalescence was satisfactory until March 19, when the patient began to have a septic temperature. This continued with evidence of left pyelonephritis, and the patient received 18 cc. of mercurochrome, 1 per cent, intravenously. This was followed by a chill and drop in temperature to 97 F. The next day the temperature remained normal and stayed so. Swelling in the left kidney disappeared, and the patient was discharged, April 11.

Braasch and Bumpus [6] report the intravenous use of mercurochrome 118 times in eighty-two patients with urinary infections. Twenty cubic centimeters of a 1 per cent solution was found the most satisfactory. Reactions were seldom severe. They state that intravenous mercurochrome is particularly effective in acute and subacute infections of the urinary tract, and also of great value in acute general sepsis of various types. In thirty-six cases in which mercurochrome was given for acute pyelonephritis, in twenty-five the temperature returned immediately to normal by crisis and in eleven by lysis.

Septicemia of Urinary Origin.—In previous papers we have given in detail the results obtained by intravenous therapy with neoarsphenamine, gentian violet and mercurochrome in various types of septicemia. The results were not uniform, and while there have been many striking disappearances of the blood stream infection, there have been a goodly number of failures, particularly when some serious lesion, such as pulmonary embolism, remained an infecting focus, from which the infection of the blood continued to recur.

Blood stream infections are divisible into two groups: (1) the simple bacteremias, which are often transient and self-curing, and (2) true septicemias, in which the process is far more serious and usually not self-limiting. In such cases, strikingly good results may be obtained by chemotherapy unless there is an extensive pathologic process which cannot be reached. In previous papers we have presented a considerable number of cases of septicemia of all types of origin with successes and failures following intravenous therapy. We have not space here to discuss this big subject.

EXPERIMENTAL PROOF OF THE VALUE OF CHEMOTHERAPY

It seems remarkable after Ehrlich's great work with arsphenamine, his demonstration that relapsing fever and other tropical diseases could be cured by chemotherapy, and his prediction that in a few years many infectious diseases would be treated by chemotherapy, that so many of the medical profession should still remain hostile to chemotherapy.

In order to answer the objection that we had offered only clinical evidence of the value of chemotherapy, permission was obtained from Dr. Hugh S. Cumming of the U. S. Public Health Service to carry out an extensive series of animal experiments under the direction of Dr. George McCoy, director of the Hygienic Laboratory, in Washington, D. C. This work was done by Hill and Ellis [7] of the bacteriologic staff of the Brady Urological Institute. More than a thousand white mice were used. A pneumococcus strain of high virulence was chosen as the test organism. This pneumococcus was so virulent that the intraperitoneal injection of 0.5 cc. of a 1:1,000,000 dilution of a broth culture was invariably fatal within forty-eight hours. A series of 124 mice were treated with 0.3 cc. of a 1:1,000 dilution of mercurochrome after inoculation with from 33.3 to 1,000 lethal doses of culture. In spite of the high multiples of lethal doses used, 16 per cent of these animals were saved by mercurochrome alone. A similar series of animals, 440 in number, were inoculated as before with the same dilution of culture, and treated with 0.2 cc. of normal horse serum. As a result, 100 mice, or 22.7 per cent, lived. In an attempt to evaluate the action of mercurochrome when used in small, nongermicidal amounts, and in the presence of serum, a third series of mice were given combined treatment; i. e., 0.3 cc. of 1:1,000 mercurochrome and 0.2 cc. of normal horse serum. The inoculations paralleled those in the first two series. Of the 404 mice given the combined treatment, 173 animals, or 42.9 per cent, were saved. This mercurochrome-serum mixture exerted no direct killing action in vitro. It is therefore fallacious to conclude that, because high dilutions of drug in vitro are not active, no therapeutic action may be expected in vivo. The excellent results obtained in these experiments in protecting mice against many multiple lethal doses of pneumococci show clearly that under carefully controlled conditions very definite therapeutic action is obtained, in some cases even under extremely unfavorable conditions.

DOSAGE

Intravenous injections of neoarsphenamine had best be given according to the rules that are usually in force in the treatment of syphilis. In adults one should usually begin with an injection of 0.3 Gm. After an interval of about three or four days, 0.45 Gm. may be given, and then after a similar interval 0.6 Gm. Rarely have we found it desirable to use 0.9 Gm.

Mercurochrome is given intravenously in a 1 per cent solution, and in simple cases, such as gonorrheas and ordinary urinary infections, one should usually commence in adults with 12 cc. After an interval of two days, 15 cc. may be given, and after an interval of three or four days, 17 cc., and after like intervals, 18 and then 21 cc. Rarely is it necessary to go above the latter, although it may be desirable to give several doses of this amount. The interval both with neoarsphenamine and with mercurochrome depends somewhat on the reaction. Should there be a very pronounced reaction it might be desirable to delay a day or two more, or to switch over to another drug.

In coccus infections it is not a bad plan to alternate between neoarsphenamine and mercurochrome. In fulminating cases, such as grave septicemias, when there is no time to be lost, it is usually wise to use larger doses of mercurochrome, at least 3 or 4 mg. per kilogram of body weight, unless the patient is very fat. We have not had nearly as good results in which initial doses of 10 or 12 cc. of a 1 per cent solution of mercurochrome were used in septicemias, as when the initial dose was about 20 cc. The considerable increase in fever which usually comes on in such cases is probably an important factor in the good result that is obtained.

We wish to reassert most positively that these drugs may be used without fear of injury.

CONCLUSIONS

The bacteriology of the urinary tract shows an extremely varied flora and organisms of a wide range of virulence and susceptibility to antiseptics.

B. coli is inhibited by 1:500,000 mercuric chloride, whereas B. lactis-aerogenes is not inhibited until the

6. Braasch, W. F., and Bumpus, H. C., Jr.: J. Urol. **15**: 341-349 (April) 1926.
7. Hill, Justina H., and Ellis, M. G.: Bull. Johns Hopkins Hosp. **44**: 40 (Jan.) 1929.

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strength of chloride in the broth culture reaches 1: 30,000.

The alkalizing bacteria are best combated by acids.

The great difficulty of eradicating infections of the genito-urinary tract is due to the fact that the bacteria have usually penetrated deeply into the tissues and glands beyond the urinary passages. On this account, injections and irrigations frequently fail to eradicate the infection.

The use of chemotherapy and protein therapy have been shown to be of distinct value.

A series of complicated gonococcus infections the cure of which was greatly hastened by the use of intravenous mercurochrome, is cited as well as the failures.

Gram-positive coccus infections of the kidneys and bladder are shown by a series of cases to have been eradicated by intravenous injections of neoarsphenamine.

Bacillary infections of the urinary tract, particularly the Aerobacter group, have been shown to be especially resistant, but cases that have responded favorably to intravenous injections of mercurochrome are cited.

Septicemias of urinary origin and cases of sepsis without blood stream infection are shown in some instances to be much benefited by chemotherapy.

The authors reassert their confidence in the great advisability of supplementing local injections and irrigations in urinary infections with intravenous therapy.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. NESBIT AND OF DR. YOUNG, DR. COLSTON AND J. H. HILL

DR. T. C. STELLWAGEN, Philadelphia: I cannot help approaching this subject from the standpoint of the surgeon and the message the papers carried to me. We all realize that the really dangerous organism to the urologist is Bacillus coli. I feel that the colon bacillus carries with it a very definite mortality rate, of which we do not take sufficient cognizance. I believe the day is coming when in the postoperative management of the stone-bearing case, the prostatic case and the kidney case, the patient will be put on very definite preliminary treatment that will tend to eliminate the inroads of this infection. With that in mind, I have made it a point to attempt an immunization of these patients before any operative procedure. I am glad to see the charts presented by Young, Colston and Hill because I have always felt that we in Philadelphia have not had that beautiful factor of lack of infection in prostatic surgery. It does hold in kidney surgery, but not in prostatic surgery, and when we read the literature we are inclined to think that we have been, perhaps, negligent. The patients do have bacilluria, but many physicians tell us that their patients do not have this complication. I do not intend to pass any aspersion toward Dr. Peacock's technic, but I do feel that with this paper and with his results this clinches more definitely the necessity for postoperative drainage in bladder surgery. I feel that Dr. Nesbit is to be commemorated for his work. This had not been brought to us in a forcible manner before. I am in thorough accord with what he says in regard to staphylococcic infections of the kidney. I think many men have been entirely too radical in the surgical approach to these cases. I believe we resort to surgery too often, when common sense and a little tactful waiting will clear up these conditions We now can put this question of staphylococcus in carbuncle of the kidney. I have seen only three of these and in one the microscope did not reveal anything of particular significance. I was called in consultation in that case with a homeopath. I think none of us would have gone in, but he had courage, and he found a carbuncle of the kidney. I would have let the case run on for a week or ten days longer. Another question I wish to mention is the "blow up" of the prostatic patient about ten to fifteen days after operation. He goes to the necropsy table and his kidney is found to be literally shot with punctate cortical abscesses. These are staphylococcic, and I think they are one of the important problems we have to consider.

DR. EDWARD L. MERRITT, Fall River, Mass.: Some years ago I took up the cystoscopic method of freeing kidney and ureteral stones and it was so successful that I wondered why we could not clear up kidney infections by the same method. Although many of them were of colon bacillus origin, I found I was successful in clearing them up by ureteral dilation and by kidney lavage through the cystoscope and ureteral catheter. Following this I saw three cases of staphylococcic infection of the kidney following some sinus infection as a complication of influenza. These were mild and cleared up under conservative treatment, such as Dr. Nesbit outlined. Last year this small series was increased by a case that I reported before the New England branch of the American Urological Association. That case was regarded as wellnigh hopeless. The patient, a boy, aged 15 years, had an infection of the left kidney, with a high temperature and leukocytosis. By cystoscopic treatment using a heavy ureteral catheter, I was successful in breaking through from the kidney pelvis, and a pure culture of Staphylococcus aureus was secured from this kidney. That kidney was irrigated thoroughly, with excellent results. I think it makes no difference what antiseptic is used, so long as one takes the lid off. The main thing in these cases, as is other infections, is to secure drainage, and if this is successfully done a great deal can be accomplished. This patient recovered spontaneously following thorough drainage.

DR. MEREDITH F. CAMPBELL, New York: Dr. Nesbit said that carbuncles of the kidney are rare. I wish to show a specimen of a rather unique and clinically interesting case. A child was admitted to the hospital at the age of 3 weeks, with furunculosis from head to foot. At the age of 7 weeks, a kidney abscess opened and drained. The child did well for a few days, when the temperature rose to 102 F. and then rapidly declined. At 11 weeks of age, no other pathologic changes being found, the kidney was explored and it was deemed wise to remove it.

DR. BUDD C. CORBUS, Chicago: During the past few years there has been a continuous search for new antiseptics with which to combat infection. While the results at times have been fairly satisfactory we are still a long way from the ideal method of treating infections of the genito-urinary tract. Antiseptics may kill bacteria in a test tube but their action in infected tissue is entirely different. Besredka has stimulated new ideas in immunization by his publications on antivirus. He has called attention to the fact that bacteria, when growing in a liquid culture medium, produce a toxin that is capable, when applied locally or injected intradermally, of producing both local and general immunity. The possibility of using the skin as an organ of immunization is being recognized more and more. It seems probable that in the near future either bacteria or their toxins will be used in the production in the skin of immune substances capable of protecting the body against specific infections.

DR. J. DELLINGER BARNEY, Boston: I think the diagnosis, especially of the mild cases, is one of extreme difficulty and they are put down as everything but cortical abscesses of the kidney, and are often operated on. They are often bilateral, or if not so in the beginning they may become so, and that is a reason for conservatism. Radical surgery, consisting generally of nephrectomy, formerly was the custom. Recently it has been found that one can be very conservative in their handling. Many patients who were very ill have recovered under conservative treatment and watchful waiting, and I have no doubt that the results would be the same as those found at operation in other cases. Many cases in which this condition is not suspected are seen at necropsy. I have seen them after prostatectomy, for example, at necropsy when there were multiple cortical abscesses which had not been suspected at all. All this makes me believe that the adhesions seen in operating on kidneys for other conditions are often due to mild attacks of this nature.

DR. VINCENT VERMOOTEN, New Taven, Conn.: I wish to offer for consideration one point, that is, the examination of the urine by studying a stained smear of freshly obtained urine. A number of years ago, I found that in 33 per cent of instances

the cultural report was entirely different from the observations made from the stained sediment of the urine. This seemed so incredible that Justina H. Hill of Baltimore took up the question also and examined 3,000 specimens of urine in this way and took cultures of them. She got the same results that I did. Organisms seen in the smear did not grow out on culture and vice versa. Nesbit, in some instances, found the staphylococcus in the urine without any pus cells; the absence of pus cells was responsible for the fact that on the preliminary examination this was overlooked. In two cases of septicemia I have been able to find organisms with no pus cells in the urine, once the streptococcus and once the staphylococcus. Blood cultures taken at the same time showed, twenty-four hours later, that these patients had a blood stream infection. I think the fact should be emphasized that the stained sediment of a specimen of urine may give indications of a positive blood stream infection before it is possible to obtain blood cultures. In some cases, this will hasten the diagnosis.

DR. W. F. BRAASCH, Rochester, Minn.: I wish to call attention briefly to a group of acute infections of the kidney which are not necessarily hematogenous in origin, although I dare say that at times they are. I refer to acute infections of the kidney following instrumentation or manipulation. This may occur with manipulation of either the lower or the upper urinary tract. When it occurs with the latter, the infection is usually ascending. It is observed occasionally following manipulation for stone in the ureter or the passage of a catheter for hydronephrosis. The acute cortical infections that result should be treated quite contrary to the method suggested by Dr. Nesbit. They are usually unilateral at least primarily, but if nephrectomy is delayed the other kidney becomes involved. They are always surgical and the sooner the kidney is removed the better is the prognosis. After the first day or two the symptoms may assume the form of a profound toxemia rather than the usual evidence of acute infection. One cannot be too careful in recognizing these cases and in advising immediate nephrectomy. If delay is permitted, the other kidney becomes infected and the patient may succumb.

DR. GEORGE R. LIVERMORE, Memphis, Tenn.: Along the line Dr. Braasch has suggested, the intravenous use of methenamine is an aid. We make it a rule in all ureteral manipulations to use methenamine intravenously, in doses of 30 grains (2 Gm.). This will mitigate and in time prevent these infections. If the theory of Dr. Corbus is correct, why not use both of these methods?

DR. J. A. C. COLSTON, Baltimore: I should like to say a few words about the method we employ in cases of colon bacillus bacteremia. It might be well to state briefly two cases which illustrate certain points. A man, aged 62, with sterile urine before operation, was subjected to perineal prostatectomy without preliminary catheter drainage. Four days after operation a severe chill occurred and a blood culture showed an overwhelming colon bacillus infection. The usual supportive measures, together with intravenous administration of dextrose, were used, but the infection persisted with a septic temperature and the patient died ten days after operation, the blood culture just before death still showing an overwhelming colon bacillus infection. Such a patient we should now treat by intravenous administration of mercurochrome-220 soluble. We do not feel that mercurochrome could possibly sterilize the blood stream, as laboratory experiments have been carried out in the Brady Clinic which have proved that this is impossible. However, we feel that the intravenous use of mercurochrome produces some sort of protective reaction on the part of the body, which reaction plays a most important part in combating blood stream infections. The degree and the severity of this reaction can be largely regulated by the size of the dose. Of its nature, we know nothing. I was interested to hear Dr. Corbus attribute these reactions to the spleen. The second case was that of an elderly woman with a stone in the kidney and a severe urinary infection. Following pyelography she had a severe reaction with chills and fever, and a blood culture showed a very heavy colon bacillus infection. She was given mercurochrome, which produced a moderately severe reaction and a day later the blood culture was negative. However, shortly after this the blood culture again became positive, with chills and fever. Mercurochrome was again given and the culture became sterile. This sequence of events happened a third time, and we began to realize that she was reinfecting herself from some focus. A roentgenogram was then taken which showed that the stone had descended into the lower part of the ureter. The stone was then removed by operation, but the patient's vitality had been so sapped that she was unable to rally. The case was particularly interesting in that on three separate occasions blood stream infection was eliminated by intravenous administration of mercurochrome and I have always felt that if the descent of the stone had been recognized earlier this patient might have been saved.

RESULTS IN CHOLECYSTECTOMY

WITH ESPECIAL REFERENCE TO THE SYMPTOMATOLOGY AND DIAGNOSIS OF CHOLECYSTITIS *

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Chronic diseases of the gallbladder and bile ducts are at present generally conceded to be the most frequent organic cause of dyspepsia. No chapter in modern medicine is more interesting than the one dealing with the rapid advancement in the recognition of the gallbladder as a cause of gastric symptoms. If one consults the textbooks and reviews the literature of little more than a decade ago, one finds the gallbladder held responsible only for the illness of those patients who suffered recurrent attacks of biliary colic.

The rapid advance in knowledge of gallbladder disease is due almost entirely to the clinician's careful study of the symptomatology, aided to a great extent by the roentgenologist's ability to rule out organic changes in the stomach and duodenum and, of late years, by cholecystography.

In a recent study [1] of 3,000 patients complaining of gastric symptoms, the gallbladder and bile ducts were considered responsible for the symptoms in 21.3 per cent of the series. The approximate relative frequency of abdominal organic disease causing dyspepsia was gastric ulcer 1, gastric cancer 2, duodenal ulcer 5, gallbladder disease 11. That one out of every five patients complaining of gastric symptoms receives a diagnosis of chronic cholecystitis is a relatively constant finding. During the past ten years, our figures relative to this statement have not varied by as much as 2 per cent.

Owing to the fact that disease of the gallbladder is such a comparatively common diagnosis and since nearly one half of the patients receiving such a diagnosis are advised to have their gallbladders removed, we considered it well worth while to ask those patients on whom we had performed cholecystectomies how much benefit they considered they had received from the removal of the gallbladder. Before discussing the results of this investigation, we made a review of the case histories of patients receiving a primary diagnosis of cholecystitis in order to obtain a general idea of the symptomatology and clinical evidence on which the diagnosis of chronic cholecystitis was made. A summary of the observations is here presented. Six hundred histories out of a series of approximately 1,500 diag-

* From the Mason Clinic.
Dr. Harrison R. Wesson assisted in compiling the statistics of the results obtained by cholecystectomy.
* Read before the Section on Radiology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.
1. Dwyer, M. F., and Blackford, J. M.: Interpretation of Gastric Symptoms: Clinical and Roentgenological Study of Three Thousand Cases, Radiology **14**: 38 (Jan.) 1930.

noses of chronic gallbladder disease were studied in detail.

Diseases of the gallbladder were diagnosed 395 times in females and 205 times in males, the ratio of incidence, therefore, between females and males being approximately 2 to 1.

The familiar saying that gallbladder disease is a disease characteristic of fat females over 40 years of age is true in the majority of instances, but, as knowledge of gallbladder disease increases, this statement loses considerably in weight. The review of these histories showed that 35 per cent of the patients were under the age of 40 and that 43 per cent of the females weighed less than 140 pounds (63.5 Kg.).

TABLE 1.—*Comparison of Age of Patients at Onset of Symptoms*

Diagnosis	Percentage Seeking Relief Before Age of 45	Percentage Dating Symptoms Before Ages of 25	Percentage Dating Symptoms Before Ages of 20
Cholecystitis	78	23	9
Duodenal ulcer	66	56	15
Gastric ulcer	36	25	4

In comparing the histories of patients suffering from duodenal ulcer and chronic cholecystitis, it is interesting to note that 50 per cent of our patients with duodenal ulcer stated that the onset of their gastric symptoms began before the age of 25, while only 22 per cent of patients with disease of the gallbladder began to have symptoms before 25 years of age (table 1).

Not many years ago, pain was considered a cardinal symptom of disease of the biliary tract, and many clinicians hesitated before arriving at a diagnosis of gallbladder disease without this as the chief symptom. Dyspepsia has been emphasized of late by various writers as a prominent complaint. Approximately three fourths (72.7 per cent) of the patients in this series sought relief on account of chronic gastric disturbances, and in over half of these the gastric symptoms had persisted for more than ten years. Localized pain or soreness of varying degrees is a common complaint, but only 18.5 per cent gave a history simulating that of one or more attacks of "gallstone" colic.

TABLE 2.—*Gastric Analyses of Four Hundred and Two Patients Receiving a Diagnosis of Chronic Cholecystitis*

Free Hydrochloric Acid	Number	Percentage	
Absent	98	24.4	55.7
Low (0-20)	126	31.3	
Medium (20-40)	151	37.5	
High (over 40)	27	6.7	

The gastric analysis was recorded in 402 cases. In 55.7 per cent of these examinations, the analysis of the gastric contents showed either the absence of free hydrochloric acid or the presence of a low acidity. In only 6.7 per cent was the free hydrochloric acid above normal. The clinician should hesitate before making a diagnosis of chronic cholecystitis on a patient presenting a history of chronic indigestion in the presence of a hyperacidity (table 2).

The roentgenologist has for many years rendered considerable assistance to clinicians in the diagnosis of chronic cholecystitis. The roentgen evidence of gallbladder disease before the advent of cholecystography consisted chiefly of the demonstration of gallstones on the roentgenogram and of the indirect signs manifested by changes in the contour, position and behavior of the duodenum and pylorus. The degree of accuracy and the value of these observations varied considerably with different roentgenologists.

Before Graham and his associates described a method of examining the function of the gallbladder objectively, we believe that the roentgenologist's chief assistance in the diagnosis of disease of the biliary tract came from the elimination of organic disease of the stomach and duodenum as a possible cause for the dyspepsia.

Four hundred and thirty-two patients in the series had routine roentgenologic examinations of the stomach and duodenum. In 405, or 93.5 per cent, the results of this examination were considered negative. Of the remaining 28 cases, 23 were reported as showing organic disease of the stomach or duodenum. We realize that occasionally a distended gallbladder or extensive adhesions from the gallbladder to the duodenum may cause deformity of the contour of the duodenum or pylorus, but such observations in this series were very infrequent. In 93.5 per cent of the patients examined there was no roentgenologic evidence of abnormalities of the duodenum or pylorus that could be attributed to a distended gallbladder or to adhesions.

Cholecystography has been a great contribution to the chapter on cholecystitis, and the profession is greatly indebted to Graham and his associates for furnishing a method of examining the function of the gallbladder objectively. Cholecystography is undoubtedly the best single laboratory test, but it should never be relied on to the exclusion of other data to affirm or deny the presence of disease of the gallbladder. The intravenous method of administering the dye has been used exclusively by us for the past five years. Positive roentgenologic evidence of impaired gallbladder function, such as absence or faint concentration, is strong presumptive evidence of disease of the gallbladder, and this has been found to be true in over 90 per cent of our proved cases. Negative cholecystographic evidence in the presence of good clinical history of gallbladder disease and negative roentgenologic examination of the stomach and duodenum should never deter the clinician from arriving at a diagnosis of chronic cholecystitis. The cholecystograms were considered negative in 21 per cent of patients receiving a clinical diagnosis of disease of the biliary tract. Occasionally it is found that the gallbladder of a nervous, temperamental patient, presenting an indefinite group of abdominal symptoms, fails to cast a shadow after the administration of the dye. Such patients, after a few weeks of medical supervision and encouragement, often show on reexamination a well functioning gallbladder, which emphasizes the fact that cholecystography is a test chiefly of function rather than of disease.

Questionnaires were sent to approximately 300 people who had received surgical treatment for chronic disease of the gallbladder. All these patients were examined by the same clinicians and the same roentgenologist and were operated on by one surgeon. One hundred and fifty-three patients responded to the questionnaire, and these form the basis of this study. We realize that patients are often confused in making out such reports, and therefore we tried as much as possible to ask only a few general questions and to frame these questions in as simple a manner as possible.

These people were asked to answer the following questions: 1. Had they obtained complete relief from the symptoms for which the operation had been per-

formed? 2. If they considered that they had not obtained complete relief, did they consider themselves 75 per cent, 50 per cent or 25 per cent benefited, or had they not received any benefit at all from the operation? 3. Had there been any improvement in their digestive disturbances and if so to what extent? 4. Had they had recurrence of colic? 5. What effect had the operation had on gas and belching? 6. Were they now able to eat certain foods that they could not eat before operation? Each questionnaire was filled out independently by the patient, and no aid or suggestions were given by a physician. The figures here presented are exactly as given by the 153 patients and are based on their own opinions as to the extent of relief derived from the operation.

In reply to questions 1 and 2, regarding the relief of symptoms, obtained by cholecystectomy, 56.2 per cent stated that they had obtained complete relief and 23.5 per cent considered that the operation had relieved 75 per cent or more of their previous complaints. One fifth of the patients in this series (20.3 per cent) answered that they believed that the operation failed

TABLE 3.—*Relief of Symptoms Following Cholecystectomy*

Degree of Relief	Number	Percentage	
Complete	86	56.2	79.7
75 per cent	36	23.5	
50 per cent	15	9.8	
25 per cent	9	5.7	
None	7	4.5	
Total, 153			

to produce the results they had hoped for, as they considered that only one half or less of their symptoms had been relieved by the removal of their gallbladder. Any operative procedure that eliminates the symptoms of 75 per cent or more of a chronic ailment may be considered conservatively in the group of good results, and 79.7 per cent of these patients considered that their operation was a cure for the symptoms for which they sought relief. Other diseased organs besides the gallbladder were removed in some cases, and this may to a certain extent have influenced favorably the end-results in these instances; however, in checking over the surgical records of these patients, we were surprised to find that diseased organs other than the gallbladder had been noted in only thirty-six patients (table 3).

The records of the 20.3 per cent of patients who replied that they had received 50 per cent or less relief of their symptoms following the removal of the gallbladder were carefully studied in order to determine if possible the reason for the failure to obtain more

TABLE 4.—*Condition of Digestion Following Cholecystectomy*

	Number	Percentage
Much improved	105	70.5
Partially improved	25	16.7
Not benefited	17	11.4
Worse	2	1.3
Total, 149		

favorable results. The surgical observations on these thirty-one patients showed that the gallbladders of fifteen were definitely diseased, and in ten of these there were stones. Four gallbladders were considered doubtful at operation, but on account of the clinical observations and in the absence of other pathologic evidence they were removed. Among the remaining twelve patients, three had received a preoperative clinical and roentgenologic diagnosis of duodenal ulcer. The surgeon reported that in these three patients no ulcers were demonstrated but that two had a diverticulum of the duodenum and the third a probable duodenitis. A retrocecal appendix was found in eight patients, and in the remaining case no pathologic changes except the scar of a gastric ulcer could be demonstrated.

TABLE 5.—*Condition of Gas and Belching Following Cholecystectomy*

	Number	Percentage	
Absent	56	37.8	80.3
Better	64	42.5	
Same	21	14.3	
Worse	7	4.7	
Total, 148			

Seven patients answered that they had received no benefit at all following their operation. The gallbladder in three cases was found markedly diseased, in each case there were stones, and in one of these three cases a subacutely inflamed appendix was also removed. In two cases the gallbladder was described as showing slight evidence of disease, and an apparently normal gallbladder was removed in another patient who subsequently had been classed by several clinicians as a profound neurasthenic. The seventh patient in the group received a clinical and roentgen diagnosis of duodenal ulcer and a surgical diagnosis of duodenitis.

Dyspepsia brings more patients with diseases of the gallbladder to the physician than any other complaint; consequently, the degree of relief of this condition is a fair index as to the benefit derived from the removal of the gallbladder. In answer to the question regarding this condition, 70.5 per cent stated that their digestive disturbances were greatly relieved, 16.7 per cent partially improved, 11.4 per cent not benefited, and two patients, or 1.3 per cent, stated that their digestion was worse following operation (table 4).

TABLE 6.—*Effect of Cholecystectomy on Food Selection*

	Number	Percentage
Better	94	68.1
Same	42	30.4
Worse	2	1.5
Total, 138		

Gas and belching are common and annoying complaints of most people with diseased gallbladders. These symptoms after operation were either absent (37.8 per cent) or markedly relieved (42.5 per cent) in 80.3 per cent; no change was noted in 14.3 per cent, and 4.7 per cent stated that they considered themselves worse following the operation. The continued absence of free hydrochloric acid in the gastric contents is the cause of the failure of some patients to receive much relief of their digestive disturbances following cholecystectomy (table 5).

Food selection is a frequent complaint. The foods most commonly avoided are rich and highly seasoned foods, fried meats, fats and raw apples. In answer to the question as to whether or not the removal of the gallbladder permitted these patients to eat without distress certain foods that they could not eat before operation, 68 per cent replied in the affirmative. Many patients were very emphatic in their statements relative to this question, affirming that they could now enjoy many foods which previously would have caused them great distress. Thirty per cent stated that they noticed no particular difference following the operation,

and only two out of the forty patients who were not benefited stated that they considered that they had to be more careful regarding the selection of food after the removal of the gallbladder (table 6).

Colic is a common symptom in patients with diseases of the biliary tract and is complained of by many in whom it is found at operation that the gallbladder and bile ducts do not contain stones. The exact cause of gallbladder and duct colic not due to calculi has not yet been definitely established. In this series, 11.8 per cent of the patients reported having had one or more spells of colic after the operation. The majority of these attacks, however, occurred in the first few years following the removal of the gallbladder, and in many of these the gallbladder and ducts did not contain stones, as only 45 per cent of the total series were found at operation to have stones.

SUMMARY

1. Chronic cholecystitis is the most frequent cause of gastric symptoms. The diagnosis of this condition by the correlation of clinical, roentgenologic and laboratory observations has reached a high degree of accuracy.

2. Nearly one half (42 per cent) of our patients receiving a diagnosis of chronic disease of the gallbladder are considered surgical patients at the time the diagnosis is made. That the removal of the gallbladder of these patients is a satisfactory procedure is manifested by the fact that 79.7 per cent state that they consider the operation a cure for the symptoms for which they sought relief.

3. The avoidance of certain foods is a common complaint of patients with diseases of the biliary tract. Sixty-eight per cent of the patients in this series stated that after the removal of the gallbladder they could eat without discomfort certain foods which before the operation caused them great distress.

4. Symptoms of dyspepsia, especially gas and belching, were either entirely relieved or greatly benefited in 80.3 per cent of the cases in which operation was performed.

5. The surgeon should not be hasty in deciding against removal of the gallbladder because of its normal external appearance if he knows that disease of the gallbladder was diagnosed only after careful clinical, roentgenologic and laboratory examinations. Lack of the appearance of gross pathologic changes of the gallbladder in situ fails to outweigh careful clinical and laboratory deductions, and failure to remove the gallbladder in such instances is generally followed by a continuation of the symptoms for which relief was sought.

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ABSTRACT OF DISCUSSION

DR. WILLIAM H. STEWART, New York: There are a certain number of cases in which it is difficult to explain why the opaque bile does not enter the gallbladder or, if it does, why there is "no shadow." Defective technic will clear away a few of them, but there remain a number in which one wonders whether there is not some chemical change in the dye after it enters the gallbladder that breaks up the iodine compound and renders the bile nonopaque. One German observer claims that as the result of the inflammation the absorption of the watery bile before concentration has occurred is so rapid that the bile does not become opaque. Lahey and Jordan, who use the intravenous technic, state that in 44 per cent of sixty-five cases of functional or spastic irritability the cholecystographic test gave a "no shadow" but that after five or ten days of bowel management the gallbladder filled normally. I believe that in these irritable spasmodic colon cases there is an associated spasm of the cystic duct, so that none of the opaque bile enters the gallbladder. When the irritation is removed, the bile again enters in a normal manner. If this is true, the obstruction might be classed as functional. The authors of the paper report 21 per cent of negative cholecystographic observations with clinical disease of the biliary tract. This is considerably higher than mine. With the oral method I expect about 15 per cent. It is, however, safe to say that it is very unusual in institutions with which I am connected for the surgeon to operate when the cholecystographic observations are negative. The authors are to be congratulated on the study that they have made in these cases, and particularly on the follow up. After all, the result of surgery of the biliary tract is the important question. Drs. Dwyer and Dowling have shown that in their cases it was well worth while.

DR. JOHN F. HERRICK, Ottumwa, Iowa: It has been my observation that a large percentage of those who complain of trouble in the right upper quadrant are not suffering exclusively from disease of the gallbladder, but in many cases there is a hepatitis. There is at present a discussion as to whether hepatitis or cholecystitis is primary. The general opinion, especially among surgeons, has been that hepatitis is a result of chronic infection of the gallbladder. My feeling is that the primary disease in the average gallbladder case is infection and dysfunction of the liver. If that is true, we are starting at the wrong end and working backward. If the primary disease is infection and dysfunction of the liver with faulty bile secretion, it is easy to understand how cholecystitis would result with all the manifestations that follow. The authors are unusually fortunate in the number of cases relieved by cholecystectomy, because my observation has been somewhat different: The percentage of cases relieved has been considerably lower and many of the patients have complained afterward that they were sorry they had the operation. If one goes back and traces the physiology of digestion with the excess of carbohydrates that we as a people are using and recalls that the liver must convert the carbohydrate into glycogen, it is apparent that the liver may find itself in the position of our agricultural board. It has its elevators all stocked and no place to dispose of the product. The consequence is hepatitis, dysfunction of the liver with defective bile secretion opening the way for inflammation of the gallbladder, secondary to the primary cause, which is this functional liver disturbance. If the radiologist will assist the internist in explaining those cases, he will do valuable work and will establish himself more and more as a consultant.

DR. MAURICE F. DWYER, Seattle: I agree with Dr. Stewart. He has added much to our paper. It is generally agreed that, owing to the lymphatic anastomosis between the liver and the gallbladder, chronic cholecystitis is associated with hepatitis, and also that the infection may spread by the venous route, as the cystic vein draining the gallbladder empties directly into the portal vein. However, some surgeons of large experience state that the so-called objective markings of the liver commonly described as hepatitis are seen more frequently at operation than the so-called normal liver. The physiology of the liver and bile ducts is interesting. There is a lot of work being done at present on the detoxifying power of the liver. Occasionally, at operation, the surgeon finds a gallbladder which objectively looks normal, although the clinical aspects of the case strongly suggest a diseased gallbladder, and discovers that the removal of the gallbladder is followed by the elimination of the symptoms for which the patient sought relief. Whether the removal of the gallbladder establishes adequate drainage of the detoxified liver or not is still open to further investigation. The review showed that 80 per cent of the patients who had the gallbladder removed considered the operation a success. We have also sent out questionnaires to an entirely different group; namely, those in whom we diagnosed chronic gallbladder disease and advised operation between five and fifteen years ago, but who for some reason or other refused operation. We were interested in knowing what became of these patients. All questionable diagnoses were eliminated, and we considered only those histories which, from the clinical and roentgen evidence, seemed to indicate with reasonable certainty an infected gallbladder. The summary of this investigation was that one third of the patients treated medically came to operation from three to five years after the diagnosis was made; one third, because of continuation of their symptoms, should have come to operation,

and one third were relieved of their symptoms. Patients who have allowed their gallbladder symptoms to go on for a number of years and whose gastric acidity has become low or absent, with definite or permanent pathologic changes in the liver, cannot expect to get as good results following cholecystectomy as those who come to early operation. Ability to eat all kinds of food is 30 per cent more likely to be obtained from early operation than from either late operation or medical treatment. There may be a lot of truth in the saying that "an apple a day keeps the doctor away," but an apple a day eaten by a patient with an infected gallbladder often causes the doctor to come a-running; it is surprising to note the number of people with chronic gallbladder disease who cannot eat a raw apple without great distress.

PRACTICAL POINTS IN OPHTHALMIC PRACTICE

A STUDY OF RECENT FOOD RESEARCHES *

LAURA A. LANE, M.D.
MINNEAPOLIS

Since early times, the existence of a relationship between diet and certain diseases of the eye has been recognized. Early Egyptian literature tells of people living on special diets, seeing poorly at twilight, and the cure of this hemeralopia by the feeding of liver.

Egypt was the greatest grain raising country of antiquity. Grass grazing land, cattle and dairy products were scarce. These conditions have continued and may be responsible for much of the eye disease existing in Egypt today.

EFFECT OF FAULTY DIET ON THE EYE

Chow [1] states that one of the most constant signs of a food deficiency is a pigmentation of the conjunctiva with reduction of the light sense to half normal or less and that 65 per cent show the reduction without signs of an avitaminosis as Bitot spots or prexerosis of the cornea. Ejler Holm [2] has shown that the retina is rich in vitamin A. An avitaminosis may cause an increase of lipoids in the outer segment of rods and a decrease of the visual purple. An excess of carbohydrates may cause serious eye disease. Shoemaker [3] and Sinskey, Levin and Sachs [4] cite cases of episcleritis completely controlled by the withdrawal of excessive carbohydrates and the resuming of a proper diet.

Reeder [5] and others call attention to retinochoroiditis developing in persons on high carbohydrate diets. Cloudy vitreous and other symptoms improve on correcting the diet.

G. M. Findlay [6] reports an outbreak of conjunctivitis and atypical pneumonia in a school near Edinburgh. Similar outbreaks had occurred; no form of treatment relieved the conjunctivitis. The food, in order to save expense, was prepared in large caldrons and boiled from three to four hours, destroying the vitamins. Findlay recommended raw swede juice and cod liver oil; the outbreaks ceased.

Merz-Weigand,[7] Gonzelas [8] and certain Japanese writers report extensive outbreaks of hemeralopia due to dietary deficiencies. In addition to lack of fat soluble A the prolonged lack of green foodstuffs and other essentials together with the increased stimulation of sunlight on a depleted retina cause this hemeralopia to occur in the springtime.

Blegvad, Bloch, Mori, Pillat, Ross, Widmark, Wright and others have called attention to xerophthalmia and keratomalacia with damage to vision and their relation to the lack of fat soluble A.

Eye changes in diabetes considered due to rapid withdrawal of carbohydrates and salts may as likely be due to the lack of calcium and other elements in long continued faulty diets producing changes in the vessel walls and chemical changes in the blood. Ophthalmologists see hemorrhages in diabetic patients at other times than when rapid withdrawal of carbohydrates and salt is made.

Retinitis pigmentosa is hereditary in about 35 per cent of the cases. Trantas [9] and others suggest the feeding of liver in this disease. Trantas says that hemeralopia and keratomalacia not too far advanced will disappear in from two to seven days with liver feeding, while cod liver oil cures in from two to twelve weeks.

COMPOSITION OF THE BODY AND OF FOODSTUFFS

The elements found in the human body are oxygen, carbon, hydrogen, calcium, phosphorus, potassium, sulphur, sodium, chlorine, magnesium, iron, iodine, aluminum, arsenic, boron, cobalt, copper, fluorine, manganese, silicon and zinc. Constant disintegration and constant metabolism go on. The body eliminates daily more or less of each of the elements. To maintain life, health and high efficiency, the daily losses of these elements must be replaced. Replacement is through the foods ingested.

CONSTITUENTS OF FOODSTUFFS

Foodstuffs are divided into (1) proteins, (2) carbohydrates, (3) fats, (4) essential mineral elements and (5) vitamins. Proteins furnish but five of the elements making up the body; carbohydrates and fats only three of these five. The remaining seventeen must be derived from other ingredients of the food intake; namely, from the ash or mineral elements.

PROTEINS

Proteins replace soft tissue losses and occur in plant and animal life. Protein [10] is necessary to life. Sherman [11] states that more than fifty have been isolated. Proteins are complex, and corresponding tissues of different species are not identical substances. Certain radicals (amino-acids), tryptophan, lysine, cystine, hystidine, phenylalanine, proline, glycine and alanine are essential.

Quality of Protein.—Vegetable protein is not as good in quality as animal protein; both are needed for nutrition. Clayton [12] has shown that the protein of liver is of high value; kidney ranks next, then beef. Proteins of poor quality and lack of vitamin A will produce xerophthalmia more quickly than proteins of high quality.

* Read before the Section on Ophthalmology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

* Owing to lack of space, this article has been abbreviated for THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

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Sources of Proteins.—Proteins are most abundant in cereals, beans, peas and nuts in vegetable life, and in meats, eggs, milk and fish in animal life. Nelson [13] says that vitamin B mitigates the ill effects of high protein diets.

How much protein is necessary? From 60 to 75 Gm. daily is usually sufficient; however, 100 Gm. may be necessary. The American diet has a fairly high protein content.

Wang, Hawks, Huddleston, Wood and Smith [14] and others found no relationship between the protein intake and the blood pressure.

Harvey and Howes [15] and others found that wounds heal more quickly under a high protein diet. This is of importance in eye surgery.

CARBOHYDRATES

Carbohydrates, much consumed, produce energy. McCance and Lawrence [16] have contributed data on the available carbohydrate content of different foods.

Carbohydrates [17] may be divided into two groups: 1. The monosaccharides, as dextrose (*d*-glucose), fructose and galactose, all form glycogen and can be absorbed directly into the blood. 2. Polysaccharides are colloids and include starch, hemicellulose, sucrose or sugar, pentosans and celluloses. They occur in grains, vegetable and some fruits. The pentosans and celluloses, little absorbed, are necessary for roughage and stimulating intestinal peristalsis.

Storage of Carbohydrate.—Carbohydrate is stored in the liver, muscles, bones and the skin. Curtailing of carbohydrate in skin diseases, especially eczema of the lids and blepharitis, is necessary.

The Consumption of Carbohydrates.—This has increased enormously. In 1924 the yearly consumption of sugar per capita was 110 pounds, or 547 calories a day. In 1926 a government survey of 80 per cent of the candy makers showed that they produced 1,083,399,754 pounds of candy.

Sugar does not contain a single vitamin or essential mineral salt. Continued consumption of large amounts of nonprotective substances, such as sugar, without a corresponding increase of protective substances may in time react on the body and on a delicate organ such as the eye.

Carbohydrate Requirements.—Voit estimated 500 Gm. a day. For the sedentary person this is too high; from a fourth to a third less is sufficient. Unless hard manual labor is done, the carbohydrate content does not need to be high.

FATS

Fats [17] represent the most concentrated form of energy foods; they are composed of radicals of fatty acids.

Storage of Fat.—Fats are stored in the body, and 0.2 per cent is found in the blood. The synthesis of fat from carbohydrate occurs and a small amount can be formed from protein. Many of the fatty acids combine with phosphorus and nitrogen, forming lipoids.

Sources of Fat.—Fats are obtained from animal and plant life. Fats and oils of the salmon, codfish and other salt water fish have a high iodine content. Eggs contain phospolipin. Butter and cream are important fats, since they contain the fat soluble vitamin A. The substituting of vegetable oils for butter is to be discouraged, since they contain little vitamin A and none of the other vitamins.

Fat Requirements.—About 1 Gm. of fat per kilogram of weight is needed.

MINERAL ELEMENTS

The mineral elements vary in amounts in different foods and also according to the locality from which the food originally came. The function of each mineral element is not yet known and much remains to be found out about their action. Many of them are potent substances playing a unique part in regulating physiologic processes.

VITAMINS

For years it has been known that a diet can be adequate in protein, carbohydrate, fat and inorganic salts but lacking in those substances known as vitamins, and that animals fed on such diets will die. If a small amount of fat soluble A and the water soluble B complex is added to the diet of such depleted animals, a remarkable change will be noted in two or three days. Little is known about the manner in which the vitamins act or about their actual chemical composition. Vitamins appear to be somewhat analogous to hormones.

Six vitamins so far have been demonstrated. These are known as vitamins A (antirachitic, antiophthalmic); B has two fractions, B_1 (sometimes called F, antineuritic) and B_2 (sometimes called G, antipellagric); C (antiscorbutic); D (antirachitic); E (antisterility). A, D, and E are fat soluble vitamins. The B complex and C are water soluble.

Vitamin A and Infection.—Vitamin A is of special interest to the ophthalmologist. It appears to have considerable to do with preventing infection. The term anti-infective is more appropriate than the earlier terms antirachitic and antiophthalmic. Attention was previously called to the relation of vitamin A to hemeralopia, xerophthalmia and keratomalacia.

Recent researches show that lack of fat soluble A is not the sole etiologic factor in xerophthalmia, but lack of vitamin B, good quality of protein, and possibly an unfavorable salt mixture in the diet also produce an ophthalmia similar to that caused by vitamin A deficiency.[28] However, it is now established that the process of metaplasia of the epithelium and changes in the ducts of the glands is not confined alone to the eye but is general in the respiratory, gastro-intestinal and genito-urinary tracts and is often accompanied by concretions. Cysts and infections of the meibomian glands as well as calcareous deposits in the palpebral conjunctiva are frequent in vitamin A deficiency. Accumulating clinical evidence appears to indicate that some obscure recurrent corneal ulcers, also corneal infiltrations of a dystrophy type, are associated with a vitamin A deficiency.

Pfannenstiel and Scharlau [29] made numerous series of experiments, inoculating rabbits with human pus containing in some experiments staphylococci and in others streptococci, pneumococci or tubercle bacilli. They found that giving vitamin A alone had little effect on staying the infectious process, but when they added B the infections were cut short and healing hastened somewhat on the addition of vitamin D. Vaccines had a more favorable effect when vitamins A and B were

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used. Mellanby and Green [30] gave vitamin A in puerperal septicemia, mostly of the streptococcus type, reducing the mortality to 28.6 per cent, while in a controlled group receiving no vitamin A the mortality was 92 per cent. This is of use to the ophthalmologist, since violent streptococcus infection of the eye occurs at times, with loss of sight.

The von Eulers [31] and others have isolated from vegetables a substance called carotene, which appears identical with vitamin A in its physiologic effects. This substance is found in carrots, in yellow corn and in the leaves of some plants. Its chemical reaction is not quite identical with vitamin A derived from animals, making it probable that vitamin A will eventually be shown to consist of two fractions, one found in animals and the other in plants.

Storage of Vitamin A in the Body.—Is vitamin A stored in the body, and where? Holm [2] has shown that the retina is rich in vitamin A, since less than 0.75 Gm. daily of retina is sufficient to induce optimal conditions and growth in xerophthalmic rats.

Recently Wolff [22] made studies on the storage of vitamin A. He examined the livers of 600 human corpses and found great variation in the amount of vitamin A stored in those who died of chronic illnesses and those who died of acute illnesses. In thirty-nine patients dying by accident, the average amount of vitamin A was 21.5 units per gram of liver. In 112 dying of acute illness the average was 20.7 units per gram of liver, and in 30.3 per cent of the remainder dying of chronic illnesses the amount was found to be less than 6 units per gram of liver. In many newborn infants the liver did not contain any vitamin A. This last fact is very important, since the greater number of cases of keratomalacia occur in children under 1 year of age. It indicates that the mother should be given a generous supply of vitamin A as well as other vitamins during the prenatal and lactation periods.

Sources of Vitamin A.—Vitamin A is derived from milk, butter, cream, cheese, cod liver oil, egg yolk, fish liver oils, liver, kidney, and roe in animal life, and from carrots, cabbage, collards, lettuce, spinach, tomato, bananas and turnip greens in vegetable life.

Destruction of Vitamin A.—Prolonged contact in open air or long heating in open vessels destroys vitamin A.

Vitamin B.—Recently two independent fractions have been demonstrated in vitamin B. Foods need to be reanalyzed to separate the two fractions. B_1 fraction contains the antineuritic property, and B_2 the antipellagric.

Storage of Vitamin B.—The body does not store vitamin B to any extent; hence the need of sufficient quantities of the B complex at all times. Vitamin B helps maintain the appetite, aids growth, reproduction, lactation, proper function of the digestive tract, including peristalsis, and increases the resistance to infection.

Absence of vitamin B_1 reduces catalysis and results in toxic products effecting the nervous system. Patients with lack of B_1 are nervous and irritable and complain of their eyes tiring easily. Patients with uveitis of obscure origin are often low in the B complex and improve when a rich source of this vitamin is given. B_2 is more resistant to heat than B_1. Absence of B_2 causes signs of ophthalmia.

Sources of Vitamin B.—Little has been done in reanalyzing the B complex foods into B_1 and B_2 (F and G). Few foods appear to contain equal amounts of each. Cereals contain more of B_1 and little of B_2. White flour has relatively little B complex, as the germ part, which is rich in B, is largely lost in milling. Milk and green leafy vegetables are rich in B_2. Bananas have considerable B_2. Yeast contains B_2 and also a fair amount of B_1. Nearly all fruits have some vitamin B; also the vegetables. Liver, kidney, oysters, heart and eggs are good sources of the B complex, probably of the B_2 fraction. Wheat germ is exceptionally rich in B complex. Highly refined foods are poor in B complex.

Destruction of Vitamin B.—Vitamin B is destroyed by the addition of soda in the cooking. B_1 is destroyed by heat.

Vitamin C.—This vitamin is the most unstable of all the vitamins to heat, especially if heated in the open air. Preserved foods, as a rule, except canned tomatoes, cannot be depended on for vitamin C. Absence of scurvy cannot be taken as a proof that there is not a lack of vitamin C. Irritability and pains of a rheumatic nature are many times due to deficiency in vitamin C. Small hemorrhages in the skin, organs, mucous membranes and the bone marrow are characteristic of deficiency in vitamin C. Repeated vitreous and retinal hemorrhages of unknown etiology may be associated with lack of vitamin C and calcium deficiency. Lack of resistance to infection has been noted many times in vitamin C deficiency. Research is making it plain that larger amounts of vitamin C are needed for vigorous health.

Storage of Vitamin C.—The body does not appear to store this vitamin. Scurvy will develop in four weeks in a man entirely deprived of it.

Sources of Vitamin C.—Oranges, lemons, grapefruit, pineapple, raspberries, strawberries and tomatoes among the fruits are high in the amount of vitamin C. Cabbage, lettuce, onions, fresh peas, rutabagas and spinach contain large amounts. Cereals and meats contain practically none. Milk contains only a small amount.

Destruction of Vitamin C.—Alkalis, including soda, destroy this vitamin. Aging and drying lessen the amount of vitamin C. Kohman and Eddy found that if materials prepared for canning were immersed in slightly salted water for a few hours they could be canned without losing vitamin C and the antiscorbutic properties. Unfortunately, few manufacturers of canned goods avail themselves of this research.

Vitamin D.—Vitamin D is ergosterol and its value can be increased by irradiation. So far, D is the only vitamin manufactured from a chemical compound. It aids in the metabolism of calcium and phosphorus.

Storage of Vitamin D.—This vitamin is stored to a slight extent in the body.

Sources of Vitamin D.—Few foods contain vitamin D. Cod liver oil, liver and the yolk of eggs contain large amounts. Milk has a little, and green vegetables small amounts.

Vitamin E.—Vitamin E is necessary for fertility and, according to McCollum, appears to be necessary for assimilation of iron. Vitamin E is resistant to heat.

Sources of Vitamin E.—This vitamin is found in vegetable oils. Wheat embryo furnishes a very potent

30. Mellanby, Edward: Diseases Produced and Prevented by Certain Food Constituents, J. A. M. A. **96**: 325 (Jan. 31) 1931. Mellanby, Edward; and Green, H. N.: Brit. M. J. **1**: 984 (June 1) 1929.

31. Von Euler, B., and von Euler, H.: Klin. Wchnschr. **9**: 916 (May 17) 1930.

form of it. Small amounts are present in meats, milk and cream.

Destruction of Vitamin E.—Evans and Burr [32] have clearly demonstrated that lard and rancid fats are capable of destroying vitamin E.

NEUTRALITY OF BODY AND FOOD INTAKE

It appears that the subject is very complex. At least six of the mineral salts enumerated, several constituents of the protein group, a small amount of fat, a considerable amount of dextrose of the carbohydrate group, and small amounts of other important body constituents are found in the vitreous and aqueous of the eye.

It is evident that even a slight variation between the salts and constituents of the blood plasma and the tissues of the uvea—with its enormous capillary system, the latter acts as an osmotic system—and the colloidal vitreous on the other side will at once react on the metabolism and nutrition of the eye. It seems most probable that cataract and glaucoma are due to physicochemical upsets in the equilibrium between this osmotic system of the uvea and the vitreous and aqueous; the whole process is but a manifestation of a similar condition in other parts of the body and the primary cause arises from improper intake of essential elements and substances in the diet, which in time lessen the resistance to infection, give rise to intestinal toxins, place added burdens of elimination of excess salts and deleterious substances on the kidney, and induce changes in the permeability of the walls of the blood vessels.

The body must be furnished with an adequate supply of foods containing sufficient essential mineral salts, vitamins and proper proportions of acid and base forming substances to maintain the body neutrality and a good state of nutrition. How can this be done? I answer, by choosing a diet of milk and its products, eggs, green leafy vegetables, fruits and a small amount of meat and by restricting the intake of cereal grains and other carbohydrates.

Amount of Food.—What about calories, standardization of diets, highly concentrated foods and the many widely advertised foods? How much food or how many calories depend on the occupation, the activity of the individual, the age, the weight, and the condition of the health. Diet is largely an individual problem. The undue attention given to the calories and excessive standardization are to be deplored. The biologic values of the foods used and the individual requirements are of far more importance. Most of the foods extolled in the advertising literature as having exceptional nutritive qualities do not measure up to the claims made. They are expensive and too often represent the propaganda of vested interests.

Food must be assimilable and palatable. Much roughage is not advisable. For the average sedentary worker the allowance of carbohydrate should be comparatively small. The total calories need to be about 2,000 to 2,500 daily. For the one engaged in considerable muscular activity the carbohydrate intake must be larger and the total calories need to be increased to 3,500 and in some cases more. Usually proteins do not need to be increased, but the quality must be considered.

There is a growing indication that the amount of vitamin C is too low. To increase it, oranges and the juice of a lemon besides one or two of the vegetable foods such as lettuce, cabbage, spinach and tomato should be taken.

More vitamin A is needed in most dietaries; additional milk, cream and butter, bananas, carrots, lettuce, spinach, liver and eggs should be used.

Vitamin B, on account of its usefulness in stimulating the appetite and combating constipation and because of its antineuritic and antipellagric properties, should be employed in the diet in the form of beans, peas, carrots, cauliflower, celery, liver, beef, egg yolk, lemons, milk, peaches, pineapple, potato, spinach, tomato, turnips, graham bread, yeast extract and wheat germ.

People must get away from the regulation cereal, bread, meat, potato and rich pastry diet. Diets containing too much carbohydrate ferment easily in the intestine, producing irritating substances. Highly seasoned foods are to be avoided. Too high a fat diet, lacking in sufficient mineral salts, vitamins and a proper amount of carbohydrate, is unadvisable. In addition to beef, lamb and other meats, the diet should include liver, kidney, pancreas and brains.

Preparation of Food.—The preparation of foods should conserve the vitamins and mineral salts. Vegetables should not be immersed in large quantities of water when cooked but should be either steam-cooked or cooked in such a manner that the salts will be left in the vegetables and not dissolved out. Salt should be used sparingly. Vegetables should not be cooked too long. It is well to use some raw, finely divided foods, such as cabbage, celery, carrots, lettuce and fruits, daily.

Allergy.—Can foods ever cause anaphylactic reactions in the eye? My answer is yes. About 45 per cent of allergic patients exhibit sensitiveness to wheat preparations; about 20 per cent to eggs, vegetables and fruits; and about 10 per cent to fish, chocolate and other foods. Conlon [33] describes allergy in the eye due to foods and the reader is referred to the works of Duke, Vaughn and others for a fuller description of allergy.

CONCLUSIONS

Evidence is set forth showing that one of the most constant signs of food deficiency is the pigmentation of the conjunctiva and the reduction of the light sense. The retina stores vitamin A, and an avitaminosis causes an increase of lipoids in the rods of the retina and decreases the visual purple. Lack of vitamin A has been responsible for epidemics of hemeralopia, xerophthalmia and keratomalacia. Vitamin A is largely stored in the liver and is much depleted in chronic illnesses; it appears to be concerned largely with preventing infection.

Vitamin B is necessary to good nutrition. Lack of B_1 causes nervousness and irritability, and patients complain of the eyes tiring easily. Vitamin B concentrate added to the diet of those suffering from uveitis of unknown etiology is beneficial.

A lack of vitamin C, combined with a calcium deficiency, may be responsible for repeated vitreous hemorrhages of unknown etiology.

The mineral salts are potent substances concerned in regulating the physiologic processes of the body. Calcium is more frequently deficient in American diets than any of the other mineral elements. Calcium deficiency occurs in vernal conjunctivitis.

The complexity of the protein constituents of foods is shown. Proteins of poor quality can cause ophthalmia.

32. Evans, H. M., and Burr, G. O.: Vitamin E: Destructive Effect of Certain Fats and Fractions Thereof on Antisterility Vitamin in Wheat Germ and in Wheat Germ Oil, J. A. M. A. **89**: 1587 (Nov. 5) 1927.

33. Conlon, F. A.: Am. J. Ophth. **2**: 486, 1919.

The consumption of carbohydrates is often two or three times the amount required for good nutrition. Excessive use of carbohydrates has been known to cause inflammatory diseases of the eye.

Excessive fat diets deficient in mineral elements and vitamins cause hyperplasia of the tissues.

The problem of food intake concerns itself with sufficient mineral elements and protective substances to maintain proper equilibrium of the body fluids and tissues.

3201 Clinton Avenue South.

NOTE.—Tables showing the various mineral constituents of foods; also the protein, carbohydrate and fat content of the edible portions and the vitamins were shown in lantern slides and will appear in the transactions of the section, as well as in the author's reprints.

ABSTRACT OF DISCUSSION

DR. ALBERT N. LEMOINE, Kansas City, Mo.: It is generally agreed that the thyroid secretion acts as a catalytic substance expediting chemical changes in the cells of the body, while the parathyroids control the calcium exchange in the body. With a deficiency of parathyroid with a normal calcium intake, one finds calcium in the stools, and a decrease in the calcium in the tissues; consequently a high calcium diet is of no avail if one has a parathyroid dysfunctioning. The anterior lobe of the pituitary controls growth and metamorphosis, while the posterior lobe assists in the control of the carbohydrate metabolism and the urinary output. The suprarenals stimulate the smooth muscles and act as a control of anaphylactic reactions. The discoloration of the skin in suprarenal deficiency greatly resembles that noted in some of the deficiency diseases. The pancreas secretes multiple ferments that control intestinal digestion of foods, especially the fats, and its internal secretions control the metabolism of dextrose. With these facts in mind, one can readily see that it is not possible to outline a diet that will meet the requirements of all patients from the mineral, the caloric or the vitamin standpoint. But one must understand the needs and deficiencies of each individual patient to prescribe the proper diet intelligently. However, it is quite true that a diet containing the proper proportions of minerals, carbohydrates, fats and pretein with a good proportion of all the vitamins will certainly act favorably in most eye diseases. I agree with the author that most patients with vernal catarrh have a low blood calcium, as that has been my experience with these patients, but in some severe cases I have had a normal blood calcium. I do not believe that the low blood calcium is due to a deficient calcium intake; it probably is due to a hypoparathyroidism causing a faulty calcium exchange. It has been my experience that in most cases an increase of calcium intake did not increase the blood calcium, but, given with parathyroid, in most cases calcium did increase the calcium content of the blood.

DR. I. S. TASSMAN, Philadelphia: I have maintained young rats on a diet deficient in vitamin A until the early ocular signs were noted, which cleared up by the addition of cod liver oil to the diet. This was in accord with the results obtained by others. More recently, vitamin A has been credited with growth promoting rather than ophthalmic properties and its absence from the diet of animals has been shown to produce lesions in many other organs with death of the animals before any marked ocular lesions developed. Green and Mellanby even found that vitamin A had an anti-infective property and claimed that at least it had a pronounced action in raising the resistance of the patient. As was noted in the paper, this should be of importance in the treatment of certain ocular conditions. From a practical standpoint, it is no doubt true that in many patients with ocular conditions there exists a deficiency or at least a partial deficiency of some of the essential food factors, particularly vitamin A. Pillat, who has studied many of these cases in northern China, has classified the ocular symptoms and signs resulting from vitamin A deficiency in a detailed form. Night blindness, loss of luster of the conjunctiva with bulbar injection, slight discharge and pigmentation of the conjunctiva, blepharitis, and hordeolum might all occur as early signs. Any one of a number of well known reasons may exist to cause an individual to maintain a uniform diet over a long period of time. Moreover, such a diet is apt to be deficient in the essentials. In the management of such cases as chronic blepharitis with crust formations on the lid margins, the ordinary subacute and chronic forms of conjunctivitis, recurrent hordeolum and chalazion, phlyctenular conjunctivitis and keratoconjunctivitis in children, episcleritis and simple ulcers of the cornea, a detailed inquiry into the diet of the patient to obtain exact knowledge of the foods included and those omitted will often reveal a real deficiency, which if corrected will do more to correct the ocular disturbances than the local treatment ordinarily used.

DR. LAURA A. LANE, Minneapolis: I feel that the iodine which one gives to patients in their food will activate a deficient thyroid, and Dr. Clark's work at the University of California seems to show conclusively that the green leafy vegetables help to fix the calcium. I hope that these patients will be treated as individuals, not in a wholesale fashion. It is an individual problem.

PNEUMOCOCCUS PSEUDOMEMBRANOUS PHARYNGITIS

REPORT OF FIVE CASES TREATED WITH ETHYLHYDROCUPREINE HYDROCHLORIDE *

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In choosing to touch on such a shopworn theme as the microbic aspect of disease, one is enjoined by propriety to select for discussion significant facts regarding fundamental phases of the subject. Accordingly, this communication will endeavor: (1) to set forth the outstanding clinical features as observed in five persons suffering from acute pseudomembranous pharyngitis; (2) to emphasize that the pneumococcus as the apparent causal agent was revealed by appropriate bacteriologic examinations on carefully selected material, after repeated previous similar examinations on "routinely" taken swabs had failed to indicate this etiologic relationship; (3) to call attention to the therapeutic efficacy of ethylhydrocupreine hydrochloride, which was suggested by the bacteriologic observations, after all attempts to alter the course of the condition by innumerable local and general remedial agents proved futile; and, finally, to impress the fact that only by close cooperation between the clinician and the laboratory worker can even the simpler laboratory methods be made useful.

SUMMARY OF CLINICAL DATA

As there was no variation in many of the clinical manifestations throughout the entire group, the data will be considered collectively.

All of the five patients included in the series were adults; three were women, aged 20, 36 and 43, respectively; the two men were 24 and 80.

Save one, all were in good physical condition. The exception was a clergyman, aged 80, who had an advanced arteriosclerosis.

There was no suggestion of a determining epidemiologic factor, such as climate, season, social status, contact infection, or associated injury or illness. All cases were sporadic.

As indicated in the table, the onset of the attacks was usually rapid, being attended by a fever of from 100 to

* From the Department of Otolaryngology, Mercy Hospital.
* Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

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102 F. and malaise. In case 4 the onset was sudden, with fever as high as 103 F., chills, myalgia and headache. The elderly man (case 5) showed few if any systemic constitutional manifestations. In fact, the systemic reaction to the infection showed greater variation than any other clinical feature. However, recurrent attacks were constant in the given person.

A remarkable constancy obtained in the local symptoms, which invariably were a severe sore throat, dysphagia and tender regional lymph nodes. The pain was described as being throbbing, burning or scalding. It was associated with a feeling of stiffness of the throat. These two symptoms led to a dysphagia that precluded ingestion of food and sometimes of liquids, for a week or more.

DESCRIPTION OF THE LESION

Site of Origin.—As shown in the table, in three cases the infection began in the pharynx and in two, on the floor of the mouth. Tonsillar tissue afforded the place of beginning in two of the three cases. However, in a homogeneous mass of fibrinous coagulum almost devoid of cellular elements. It is important to note that the bacteria were never numerous and occurred in the deeper zone, especially at the advancing margin.

Laboratory Observations.—The leukocyte counts ranged from 6,600 to 9,500. Differential counts in two cases showed the normal ratio of the leukocytes.

Save for a trace of albumin in two cases, urinalysis gave negative results.

The complement fixation test for syphilis was negative in each case.

Bacteriologic Examination.—Unquestionably, the recognition of the pneumococcus as the predominant bacterium in each member of this series ultimately depended on appropriate bacteriologic examination of intelligently selected material. The previous failures of similar bacteriologic methods to place this microorganism in the light of at least a possible causal rôle on materials from the same persons neither condemns the method nor incriminates the examiner. It does,

Analysis of Five Cases of Pneumococcus Pseudomembranous Pharyngitis Treated with Ethylhydrocupreine Hydrochloride *

Case	Sex	Age	Number of Former Attacks	Duration of Former Attacks, Days	Site of Orig n of Pseudo-membrane, All Attacks	Anatomic Distribution of Pseudo-membrane, All Attacks	Present Attack; Charac-ter of Onset	Number of Days Before Treat-ment with Ethyl-hydro-cupreine	Number of Days of Treat-ment	Comment
1	♀	43	6	14-21	Left tonsil	Entire oro-pharynx	++	3	5	Pharynx cocainized before administration of ethylhydrocupreine; tonsillectomy and adenoidectomy one month later
2	♀	20	2	10-14	Naso-pharynx	Postpharyn-geal wall	++	2	4	Tonsillectomy and adenoidectomy one year ago after two similar attacks
3	♂	24	3	10-14	Right tonsil stump	Entire oro-pharynx	++	2	4	Incomplete tonsillectomy and adenoidectomy three years ago for similar condition; secondary tonsillectomy and adenoidectomy three months later
4	♀	26	...	.....	Floor of mouth	Entire cavum oris	+++	4	7	Associated gingivitis (Vincent's) requiring solution of potassium arsenite; patient died two years later of pneumonia; previous tonsillectomy and adenoidectomy
5	♂	80	?	.....	Floor of mouth	Entire cavum oris	+	10	7	Patient was moribund at time and died of advanced arteriosclerosis two days after disappearance of pseudomembrane

* In this table, ♂ denotes male; ♀, female; +, an insidious onset with no systemic reaction; ++, a rapid onset with moderately pronounced constitutional symptoms; +++, sudden onset with marked constitutional reaction.

one instance a successful tonsillectomy did not prevent a recurrence (case 2) or an initial attack (case 4).

Extent of Involvement.—Both cases originating on the floor of the mouth extended along the plica sublingualis to involve the pharynx. The lesions beginning in the pharynx did not spread anteriorly. In no instance was the tongue or the vestibule involved. Macroscopically, the exudate was very similar in appearance in all cases. The mature pseudomembrane was white, shiny, smooth and odorless. It was thick and surrounded by a narrow red areola. Being leathery, it was "diphtheritic." However, this term has been avoided purposely so as to obviate etiologic confusion. The membrane was fairly adherent, especially at the advancing border. As it separated, an extremely superficial base, composed of an eroded, frosted mucous membrane, stippled with petechiae, was seen. There was no destruction of tissue, and healing occurred rapidly, without scarring. It was perhaps less leathery, more friable, less adherent than the true *diphtheritic* pseudomembrane. However, this distinction was by no means sufficiently definite to be of convincing diagnostic value. Microscopically, the membrane was found to be

however, emphasize the necessity for a close cooperation between the clinician and the bacteriologist and, consequently, places a responsibility on the practitioner to see that representative material is procured for examination.

Only by obtaining a piece of the fibrinous exudate from the advancing border can one expect to gain accurate information as to the bacterial flora of the lesions. Without exception, loose or entirely separated pieces of membrane yielded a host of habitués among the oral flora, which had long since overgrown the pneumococcus.

The methods employed in this investigation represent a standard procedure with us and involve ordinary forms of bacteriologic technic; namely, (1) direct smears of crushed exudate stained by Gram's method, by Loeffler's alkaline methylene blue (methylthionine chloride U. S. P.) and by dilute carbolfuchsin (1:10); and (2) cultures on Loeffler's serum medium and on plain serum broth, with subsequent isolation and identification of the various parasitic types.

The pneumococcus is a lanceolate, gram-positive, encapsulated diplococcus, forming a round umbilicated

greenish colony on blood agar; it is bile soluble and usually ferments inulin.

Briefly, then, the pneumococcus was recognized as the predominating organism in each of the five cases, when newly formed exudate was examined. It occurred in pure culture on two occasions, and in symbiosis with a few well known members of the oral flora in the other three instances. Of the isolated strains of pneumococcus, three were subjected to serologic tests, and all fell in the large miscellaneous group commonly called type IV. No virulence determinations were made.

Among those instances that yielded other organisms in addition to pneumococci, one deserves comment. A large number of the fusospirillary forms commonly associated with Vincent's angina occurred, with a hemolytic streptococcus (Streptococcus pyogenes). Clinically, there was an extensive gingivitis along the alveolar ridge of the lower jaw (case 4).

TREATMENT

It was the recognition of the pneumococcus in practically pure culture in the first case that suggested the use of ethylhydrocupreine (optochin) hydrochloride, an alkaloid related to quinine and of high pneumococcidal properties. To the lesions of the first patient, an introspective woman, was applied by cotton applicators a fresh aqueous solution (1 per cent) of ethylhydrocupreine hydrochloride. So painful was the procedure that the treatment was repeated only once a day after preliminary cocainization. In the remaining cases a 2 per cent solution was used, sometimes as often as every two hours, following partial disintegration of the pseudomembrane by fresh hydrogen peroxide. None of these patients complained of pain.

Reference to the table will give some idea that the gratifying therapeutic response was not only in shortening the course of the infection but more particularly in the almost immediate alleviation of pain, salivation and dysphagia. In the two cases that required a week for the exudate to disappear, one had a marked gingivitis which required the administration of solution of potassium arsenite (Fowler's solution) and later the extraction of the lower teeth. In the other patient, a moribund old man, the exudate disappeared entirely in a week, and two days later he died in his sleep. No toxic manifestations appeared in any patient.

LITERATURE

The relevant literature has been surveyed with reasonable diligence. No attempt has been made to expiscate articles consigned to oblivion. The number of references found was relatively few. In most of the older cases, convincing evidence as to their true pneumococcic pseudomembranous nature is lacking. Most of the reports appear in the French literature: Reh[1] reports nine cases; Riser and Bert,[2] two cases (all in children). Reich and Schomerus,[3] in Germany, mention ten instances involving the pharynx. Heindl,[4] in describing a personal case, mentions two reported by Paltauf and six by Koritschoner. A good instance appears in a report by Ramos.[5] Many of these cases present bacteriologic and clinical conditions similar to my cases.

A good many instances of a pneumococcic pseudomembranous lesion in the nose and trachea have been reported. More, however, appear to have been due to streptococci. Of course, the vast majority are caused by Bacillus diphtheriae. Deep, ulcerative lesions were noted by Semon[6] and by Foster.[7]

Since Morgenroth and his co-workers[8] in 1911 isolated ethylhydrocupreine, it has been used in the treatment of various types of pneumococcic infections, notably in conjunctivitis, empyema, meningitis and lobar pneumonia. The best results have been seen in cases presenting conjunctivitis and empyema.

In most of the cases in the literature any efforts at specific therapy have been confined to vaccines and serums. I have been unable to find a formal account of the treatment of acute pneumococcic pseudomembranous pharyngitis by ethylhydrocupreine.

SUMMARY AND CONCLUSIONS

1. Pertinent bacteriologic and clinical data from five adult persons suffering from an acute pseudomembranous pharyngitis, beginning in two cases as a stomatitis, are presented.

2. In all the cases a typical pneumococcus was found, by standard bacteriologic methods of examination of the fibrinous exudate, to be the dominant micro-organism.

3. Clinically the local symptoms are constant and consist of a severe sore throat, salivation, dysphagia and cervical adenitis; the systemic reaction varies considerably.

4. The characteristic lesion is uniformly found: a white, fairly tough, fairly adherent, odorless sheet of fibrin on a superficially eroded oropharyngeal mucosa. It is very similar to the *diphtheritic* pseudomembrane caused by the Klebs-Loeffler bacillus. Diagnosis should be made by bacteriologic examination.

5. The condition does not endanger life as a rule; attacks tend to recur.

6. The lesion resists most types of local and general therapy.

7. Striking results were obtained by the topical application of ethylhydrocupreine hydrochloride.

8. The cardinal importance of a close cooperation between the clinician and the bacteriologist is stressed.

515 Grant Street.

ABSTRACT OF DISCUSSION

DR. WALTER ROBERTS, Philadelphia: In going over a copy of Dr. Richey's paper, which he sent me a few days ago, I was impressed with the fact that it contained much that was new to me. I am willing to admit that I had not realized the important part that the pneumococcus sometimes plays in throat infections. Those of us who have had many years' experience in the treatment of pseudomembranous pharyngitis and have felt that we were fairly competent in the diagnosis and treatment of the various conditions which we encountered may now feel a little chagrined that we failed to recognize this pneumococcic type of the disease. The diphtheritic, the streptococcic and the Vincent's angina membranes all have their appropriate treatments and usually are satisfactorily dealt with, but occasionally we have not achieved the rapid results that we expected, and now in looking back I should not be surprised if the pneumococcus was to blame. It is very possible that they were mixed infections and our treatments had no effect on the pneumococcic side of the trouble. In these days when our colleagues in the laboratory are ever ready to help in our diagnosis and treatment there is no excuse for our failing to recognize these pneumococcic, pseudomembranous pharyngitis cases and

1. Reh, T.: Arch. de méd. d. enf. **20**: 131 (March) 1917.
2. Riser and Bert: Arch. de méd. d. enf. **26**: 670 (Nov.) 1923.
3. Reich and Schomerus: Centralbl. f. Bakteriol., Ref. **44**: 650, 1909.
4. Heindl, A.: Wien. klin. Wchnschr. **33**: 250 (March 18) 1920.
5. Ramos, A. A.: Pneumococcus Tonsillitis, Arch. espân. de pediat. **4**: 273 (May) 1920; abstr. J. A. M. A. **75**: 844 (Sept. 18) 1920.
6. Semon: Brit. M. J. **1**: 1525 (June 26) 1909.
7. Foster, B.: M. J. Australia **2**: 262 (Sept. 27) 1919.
8. Morgenroth: Berl. klin. Wchnschr. **48**: 1560, 1927, 1911.

to give them the appropriate care. We must not forget that a diagnosis of the condition under discussion can be made only by a careful bacteriologic study. In the future, when I meet a pseudomembranous pharyngitis that does not respond to the usual treatments, I shall see to it that a careful bacteriologic study is made, and if there is a predominance of pneumococci, I shall apply 1 per cent solution of ethylhydrocupreine.

DR. HORACE JAMES WILLIAMS, Philadelphia: Little has been written in either the English or the American literature concerning pneumococcus pseudomembranous pharyngitis. In 1908, Henry Albert of Iowa City reported his observations of pseudomembranous inflammations of the pharynx caused by staphylococcus, streptococcus, Vincent's organism, and Micrococcus catarrhalis. In his observation the streptococcus was most often the offending organism. Vedal reported a similar epidemic of pneumococcic angina in which five cases occurred, with three deaths. In 1909, John Elliot reported in the *British Medical Journal* an epidemic of pneumococcic pharyngitis occurring at the same time as an epidemic of pneumonia. Most of his cases showed the pneumococcus present in the pharynx but without a membrane. Sir Felix Simon described several cases of ulcerative pharyngitis with perforation of the palate and brought considerable evidence to show that they were pneumococcic in origin. I have seen but one case, and this might be questioned. In a boy, aged 10 years, an acute pharyngitis developed, with a temperature ranging from 100 to 101 F., and a marked angina. The pharynx was covered with a yellowish exudate, and at first the condition was thought to be diphtheria. The culture revealed the presence of pneumococci. The patient was treated with 1 per cent solution of ethylhydrocupreine after the membrane had been removed. By the eighth day the membrane had disappeared and the patient's symptoms rapidly subsided.

DR. DE WAYNE G. RICHEY, Pittsburgh: While I cannot bring myself to accept in full measure their generous remarks, Drs. Roberts and Williams have encouraged me to continue that which was previously foreshortened by time. The poikilonymous title "Pneumococcus Pseudomembranous Pharyngitis" was designed to connote the chief sources of its subject's data, bacteriologic, pathologic and clinical; to imply a probable pneumococcic origin for these five cases, an inference consistent with the evidence, but not necessarily to pose the pneumococcus as the specific etiologic agent—an assumption neither justified by the facts nor essential to the propositions of this discussion. Moreover, "pseudomembranous pharyngitis" is not recognized as a pathologic process or a clinical entity peculiar to pneumococci. Indeed, "pseudomembranous" is employed purely in an anatomic sense to indicate a membrane-like expanse of solidified fibrinous exudate, with or without subjacent necrosis. It embraces, therefore, terms like "croupous" and "diphtheritic," and symbolizes the defensive and protective response of oropharyngeal mucosae to irritants of degree rather than of kind, particularly bacteria and notably Corynebacterium diphtheriae, Streptococcus hemolyticus and Pneumococcus. Conceding the supremacy of the Klebs-Loeffler bacillus, one wonders why pneumococci—arch elaborators of fibrin on superficially denuded mucosal epitheliums—have been encountered less frequently than the common pyogenic hemolytic streptococci. One wonders, too, that most of the recorded attempts at specific treatment have been confined to serum therapy, because, by virtue of acuteness, superficiality, ready regional accessibility and low absorbability, this condition meets virtually all the essential requirements for successfull chemotherapy. Even so, and admitting ethylhydrocupreine's high pneumococcidal properties in vitro, one encounters two formidable barriers to local chemotherapeutic idealism: the relatively slow action of ethylhydrocupreine in vivo and the low penetrability of aqueous solutions. In practice, these hazards can be circumvented best by frequent topical applications (as often as every hour, if necessary) and by disintegration of the false membrane by fresh hydrogen dioxide. Under no circumstances should the pseudomembrane be removed forcibly, since it provides a scaffolding conducive to scarless healing. But, above all, it must be remembered that rational specific therapy depends on correct bacteriologic diagnosis, which in turn depends on well devised examinations on astutely chosen materials.

Clinical Notes, Suggestions and New Instruments

HENDERSON IMPROVED STAIN FOR STIPPLE CELLS

W. E. DEUEL, M.D., PENNSGROVE, N. J.

To those interested in blood work in connection with the lead industry, I wish to suggest the use of a stain for stipple cells that has proved superior to all others that have been used in an industrial hospital with which I am associated.

This stain was developed by Carl W. Henderson, laboratory technician, du Pont Dye Works Hospital. He examines an average of ninety smears a week and with the usual method of staining too much time was required. With the Henderson method only about one-half minute is required, as compared to five minutes with other stains.

There is no precipitate, making it easier, therefore, to distinguish the basophilic granular cells. The contrast is greater and there is only one step in staining the smear.

Methylene blue	3.75 Gm.
Gentian violet	1.00 Gm.
Add:	
Sodium hydroxide, 10 per cent	5 minima
Methyl alcohol, q. s. ad	250 cc.

Blood smears do not need to be fixed. A Coplin jar is used. Smears are placed in the Coplin staining jar of solution for about one minute, washed with dilute ammonia water, and then rinsed with distilled water. Acetone free alcohol is used.

Dilute ammonia solution:	
Stronger ammonia	5 cc.
Distilled water	3,000 cc.

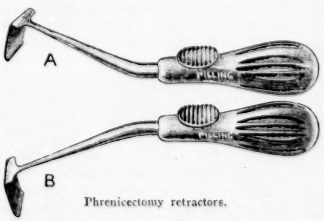
34 Ziegler Tract.

NEW PHRENICECTOMY RETRACTORS

W. E. DELANEY, JR., M.D., WILLIAMSPORT, PA.

Proper retraction in phrenicectomies is the most important factor in the skilful and speedy completion of the operation through an incision of minimum length. Retractors in present use have been found unsatisfactory because of their width, thickness, narrowness, shortness or other disproportion.

In order to secure retractors to meet all needs in the operation, I have designed the instruments[1] illustrated here and have found them entirely satisfactory. The instruments are made



Phrenicectomy retractors.

of such thinness as to encroach as little as possible on the space within the incision. The width is that which is considered most satisfactory for retraction in a small incision. The depth of the face of the retractor has been designed to meet the needs in the thick necked as well as the long, thin necked patient. The curve at the tip is such as to hold properly the retracted tissues without causing sharp pressure on an important structure.

In order to remove the assistant's hands from the operative field and to make it comfortable for the assistant as he reaches across the patient, the handles of the retractors have been constructed with differing curves for lateral and medial retraction. Retractor *A*, with the concave handle when the instrument is in position, is for retraction laterally on whichever side the incision is made. Retractor *B*, with the convex handle, is for medial retraction. The two retractors are used simul-

1. These instruments are manufactured by G. P. Pilling & Son Company, Philadelphia.

taneously, and the pull of each is enough to offset the pull of the other. The use of these retractors permits exposure of the phrenic nerve through the smallest possible incision and should be helpful to surgeons performing this operation.

416 Pine Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.
H. A. CARTER, Secretary.

COLON IRRIGATIONS

THEIR ADMINISTRATION, THERAPEUTIC APPLICATION AND DANGERS

WALTER A. BASTEDO, M.D., Sc.D.
NEW YORK

The colon irrigation has come into extensive use for the removal from the bowel of abnormal mucus, toxic products and bacteria; therefore, as part of our therapeutic armamentarium, it deserves consideration. Between enemas and irrigations there would seem to be no sharp dividing line, yet they are distinct in their purposes. In medicine, the term irrigation conveys the idea of washing; therefore, while the ordinary enema is given with the purpose of inducing defecation, the irrigation is administered, not to induce defecation, but to wash out material situated above the defecation area and to lavage the wall of the bowel as high as the water can be made to reach. To accomplish its purpose an irrigation requires (1) that the fecal mass in the lower colon shall have been expelled and (2) that the liquid shall be passed into the colon so gently that it does not arouse the defecation reflexes. Otherwise it is not a properly given irrigation.

METHODS OF IRRIGATION

There are two primary methods in common use, the one tube and the two tube. With either method the intelligence, skill and experience of the nurse count for much in obtaining results.

The One Tube Method.—This involves filling the colon to capacity through a single tube and then allowing the liquid to run out through the same tube, the process being repeated a number of times. The tube most favored is velvet-eyed with closed end, number 34 French, and is inserted about 6 inches. As demonstrated by roentgenograms, when the ordinary colon tube is passed beyond 6 or 8 inches, it coils up in the upper rectum and, no matter how much of the tube is inserted, it rarely enters the descending colon. There is therefore no benefit to be derived from passing a long colon tube 18 or 20 inches to form such a coil in the rectal ampulla.

Tubes of large caliber, number 38 to 50 French, are also sold for irrigation purposes. Their advocates claim that after the sigmoid flexure is washed out the end of the tube may be pushed on to the splenic flexure for cleansing the descending colon, then to the mid-transverse colon or hepatic flexure for cleansing the transverse colon and then to the cecum for lavage of the cecum and ascending colon. One of these advocates asserts that "a stiff colon tube in the bowel will render it powerless to coil or form loops." He shows several pictures in which the end of the tube is in the transverse colon or hepatic flexure and one in which, *after the insertion of 69 inches of tube*, the end is practically in the cecum.

The passage of such a heavy stiff piece of hose for more than a few inches I consider a dangerous procedure. Moreover, the high insertion is unnecessary, for the universal use of the opaque enema in roentgen work has demonstrated beyond question that with a tube inserted 3 or 4 inches into the rectum and a pressure level of 2 feet, the liquid will reach the cecum in from two to five minutes. There is no specific difference, therefore, between a "low irrigation" and a "high irrigation," and such misleading terms should be abolished. In reporting his roentgen studies with enemas of a mucilaginous suspension of barium followed by irrigation with the large single tube, Fineman remarks: "In a few cases with the tube in the sigmoid and even in the transverse colon or cecum, a great amount of the barium remained in the colon after the irrigation . . . In some cases there was better emptying from a 4 inch tube than from one passed into the cecum . . . As yet final deductions concerning the necessity or advantage of introducing the tube far into the colon are not warranted."

The Two Tube Method.—This employs separate inflow and outflow tubes and is the method that I prefer. It seems to me more successful in promoting relaxation and avoiding over-distention. For the inflow I use a soft rubber velvet-eyed catheter, number 20 to 24 French, inserted from 5 to 6 inches, and for the outflow, a velvet-eyed closed-end rectal tube (or stomach tube), number 30 or 32 French, inserted from 3 to 4 inches. The patient is placed on an ordinary mattress couch, rather than on some elaborately built and patented table. The details of the method are as follows:

DIRECTIONS FOR THE NURSE

1. If the patient has not defecated, empty the bowels with a plain water enema and wait fifteen minutes for the defecation reflexes to quiet down.

2. For the first gallon have the patient lie on the left side with the knees drawn up. After that have the patient lie on the back.

3. Hang the reservoir so that its midlevel is not more than 2 feet above the rectum.

4. Having freely lubricated the tubes with white petrolatum, have the patient bear down as at stool and insert the inlet tube 5 or 6 inches, allowing the water to flow during its insertion. Then insert the outlet tube 3 or 4 inches.

5. Use plain water at or just above body temperature, and let it run in slowly to avoid arousing the defecation reflexes.

6. If the outlet tube becomes plugged, inject a little water through it with a hand bulb. If this does not clear it, withdraw it without disturbing the inlet tube, clean it and reinsert.

7. Terminate the irrigation when convinced that the colon is clean or when you think the treatment has been sufficiently prolonged. We expect an irrigation to consume from 6 to 10 gallons and to take nearly an hour.

8. After the irrigation, have the patient empty the bowels into the toilet. Examine this return before the toilet is flushed.

9. Report particularly on the various odors and on the amount and character of the mucus, feces and recognizable food particles in each gallon of the returns.

THE LIQUID EMPLOYED

Because of the large amount of liquid introduced, I use plain water. Sodium chloride solution has not shown any advantage and, in some cases, makes the patient thirsty and unduly activates the bladder. Sodium bicarbonate solution is frequently employed as a solvent for mucus. But it does not dissolve the thick heavy masses of mucus found in mucous colitis; it

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unduly activates the kidneys; it may overalkalize the bowel and the patient; and, not infrequently, it generates undue amounts of gas. I have had a number of complaints of colic from sodium bicarbonate, while in the same patients plain water did not arouse colic. With roentgenograms, Fineman showed that plain water is more cleansing than solutions of sodium chloride or sodium bicarbonate. I do not suggest that saline of sodium bicarbonate solutions should never be used, but as a routine I prefer plain water. Sodium carbonate (washing soda) dissolves mucus better than does sodium bicarbonate and generates less gas, but it is a much stronger alkali and it has caustic properties. In my opinion it should not be introduced into the colon.

I do not ordinarily employ astringents or antiseptics. The strongest antiseptics permissible in the bowel do not kill the bacteria and are prone to be injurious to the wall of the colon. The Dragstedts and Nisbet at the Mayo Clinic showed the impossibility of sterilizing the intestine by ordinary antiseptics. In tied off intestinal loops they placed 70 per cent alcohol, ether, a 2 per cent compound solution of cresol, 5 per cent silver nitrate, a saturated solution of zinc chloride, 5 per cent phenol, 10 per cent thymol in alcohol, a saturated solution of phenyl salicylate, a saturated solution of quinine sulphate, surgical solution of chlorinated soda, a solution of mercuric chloride, and the solids, camphor, menthol, naphthalene and betanaphthol. In all these cases they failed to obtain sterilization. How, then, could an antiseptic effect be expected from the weak solutions permissible for irrigation purposes? The bowel is freed from bacteria much more by washing out its contents and by the removal of masses of mucus which cling tightly to the mucous membrane and harbor innumerable bacteria between this and the mucous sheet.

I use from 6 to 10 gallons of fluid at a temperature of about 100 F. Weitz and Vallers find that both heat and cold lower the tonus of the colon but that the heat effect is stronger and more lasting. Possibly a hotter fluid might be of benefit when the colon is irritable.

FURTHER CONSIDERATIONS

Irrigations are not given to move the bowels but rather to reach the regions beyond the defecation area of the left colon, the regions not cleaned out by defecation. Just as a stomach is lavaged with water until it is clean, so is an attempt made to lavage the colon until it is clean. True, one can fill the colon with 2 quarts of water, have it pass to the cecum in two or three minutes, as shown by roentgenograms, and have it reexpelled. But this does not suffice. In mucous colitis the thick tenacious mucus may take a lot of soaking before it can be liberated from the mucous membrane to which it clings so tightly. At autopsy I have found it a difficult matter to remove this mucus even with forceps and under a strong stream of water. Moreover, the site of the putrefaction or infection, as shown by Herter and others, is not infrequently the terminal foot or two of the small intestine. After several gallons had been used in washing the colon, with the patient quite relaxed, and even after an enema had been given, it has been my experience in numerous cases suddenly to obtain rotten putrefying material, as if the ileocolic sphincter had just opened and let down bad ileal contents.

When an irrigation is unsuccessful in obtaining the mucus, a brisk cathartic given the same night may result in the passage of large quantities of mucus, apparently softened by the water of the irrigation, and sometimes in the passage of foul putrefactive stuff, presumably from the small intestine and completely missed by the 6 or 8 gallons of water employed in the irrigation. When the mucus proves regularly to be loosened with difficulty, I give a small dose of phenolphthalein the night before or a small dose of salts the morning of the irrigation. Cleaning diseased bowels is not an easy task, and Alvarez and Freedlander have shown that even in the normal bowel sidetracking is a common trick. They gave normal persons small beads with their food and found that many days and even weeks elapsed before the last beads were passed in the stools. Some of the subjects with apparently normal movements took a week to pass as much as 70 per cent of the beads. One person whose bowels were constipated did not pass the last of the beads until the fortieth day.

It must be evident that if the whole colon is irrigated the water cannot return clear, and that a "clear return," as so frequently reported by the unspecialized nurse, means that the water did not get up. In many of our hospitals only twenty minutes are allowed to prepare for and give an irrigation; it is often given between 7 and 8 o'clock in the morning before the bowels have had a chance to move; there is no effort to obtain a movement of the bowels in advance of the irrigation; and the bag is placed 4 or 5 feet high so that the water can be rushed in. This is not a proper irrigation.

For ordinary mucous colitis, putrefaction or focal infection cases I employ the irrigation two or three times a week at first, then every five days, then once a week. I use irrigations oftener only in acute cases of other types. The introduction of water or other liquids into the bowel, whether as an enema or irrigation, is an abnormal procedure, and cleaning out the whole colon too frequently may harmfully interrupt its normal functions. The colon receives a large amount of liquid material from the small intestine all day long, and expels a comparatively small amount of concentrated material only once or twice a day. Its chief physiologic functions are therefore retardation and absorption, and it secretes mucus. It is not a sewer and when the fecal contents are in the state of sewage an evacuation or irrigation is indicated. So far as mucus is concerned, an irrigation is indicated only for the abnormal thick membranes and strings of mucous colitis. The mere return of mucus, as reported by a nurse, does not of itself justify the repetition of the procedure. Indeed, overirrigation, like overcatharsis, may result in the production of much mucus. This is not, however, of the mucous colitis type. If given daily, irrigations remove an undue amount of nutritive material and interfere with the normal regulation of the bowels. Moreover, an irrigation may be a weakening and disturbing process for the patient. Therefore, irrigations are justified only by the value of their results and should be prescribed with the foregoing facts in mind.

In some circles there has been much criticism of the use of irrigations in mucous colitis, but I have been able to relieve many patients who have been denied the advantage of irrigations by physicians opposed to the procedure. When one sees the dirty gray, brown or blackish sheets, strings and rolled up wormlike masses of tough mucus with a rotten or dead-fish odor that are obtained by colon irrigations, one does not wonder

that these patients feel ill and that they obtain relief and show improvement as the result of the irrigation. In Europe, where the usual colon lavage consists of 2 liters of water or mineral water, administered once or twice a day, I have found a holy horror of the use of the large amounts of water employed in our irrigations. The doctors speak of them as "massive douches." But invariably when I have been able to induce a visiting European physician to watch one of my nurses give an irrigation and have studied the irrigation returns with him, he has been impressed with its value and in some instances has bought several sets of tubes for use at home.

Repeatedly when stool examinations have failed to suggest putrefaction or to show abnormal mucus, an irrigation has brought down putrid material or the characteristic colitis mucus. Thus a test irrigation is a diagnostic procedure. The microscope will also reveal the presence or absence of numerous leukocytes in the mucus, thus distinguishing the more inflammatory from the less inflammatory types. Irrigations are of value also in revealing departures from the prescribed diet.

Those who need irrigations must be distinguished from those who do not need them, for there are many persons, especially those with mucous colitis, who acquire the irrigation habit and resort to this measure whenever they become conscious of the lower part of the abdomen or feel what they describe as "toxic." They are encouraged in this attitude by the commercialized irrigation specialists, who are unduly numerous but do a thriving business. But this self-medication is just as reprehensible as any other self-medication and should be combated by the physician.

The method is not to be condemned because it is overused by exploiting nurses; but physicians are to be condemned who order frequent irrigations without specifications, who do not examine the character of the return, and who base their subsequent treatment of the patient on the usual perfunctory report of a nurse. It requires an intelligent, experienced and interested operator to observe properly and to assess correctly the character of the mucus and fecal matter and the significance of the sundry odors that are obtained at different times during the irrigation.

UNTOWARD REACTIONS

The untoward reactions are nausea with a feeling of pressure in the epigastric region; undue abdominal distention; cramps; anal irritation; and, following the irrigation, a feeling of weakness. The nausea is practically never sufficient to demand discontinuance of the irrigation. The distention is not uncommon with inexperienced nurses using the single tube method. Unless the bowel is filled with gas it can readily be governed by the operator. Cramps or colic may be associated with too rapid administration, the loosening of mucus, an undue amount of gas, the taking of a cathartic the night before, or an irritable colon. In the last case a painless and successful irrigation may usually be accomplished by the administration half an hour or an hour before the irrigation of a capsule containing codeine, 0.03 Gm. (½ grain), and atropine sulphate, 0.6 mg. (1/100 grain). In conditions of anal irritation, the irrigation may be preceded by a suppository containing ethyl aminobenzoate, 0.3 Gm. (5 grains), and the application of a 5 per cent ointment of ethyl aminobenzoate. In some cases the single tube is less irritating to the anal region than the double tube. The postirrigation weakness is minimized by a period of lying down with relaxation. However, most patients feel better after the irrigation than before.

MISHAPS AND DANGERS

The most common mishap reported is bleeding from the rectum. In examining these patients I have found that the blood usually comes from hemorrhoids, though occasionally from a fissure or ulcer. In two instances I have found a torn rectal valve and in several others an injured or severed polypus. On three occasions nurses have found in the return a "piece of flesh," which proved to be a detached polypus. These severe traumas resulted from the use of too stiff a tube or a tube with a sharp-edged terminal opening. Dr. J. M. Lynch tells me of perforation of a sigmoid diverticulum by the irrigation tube. In his advocacy of the large tube, Snyder states that "unless the greatest of care and skill is exercised during this manipulation an abrasion or perforation of the colon wall may readily result," though he fails to mention specific instances of either.

The charge that colitis or permanent dilatation of the bowel may result from irrigations has not been substantiated. In many roentgen studies Snyder did not find dilatation of the bowel in any patient, though many had been subjected to large numbers of irrigations at close intervals. In a study of the effects of enemas, Soper found the rectal tone improved.[1]

SUMMARY

I have been considering the methods of administration, the therapeutic application, the abuse, and the dangers of repeated or routine colon irrigations. These are employed in chronic states of the bowel, such as are encountered in mucous colitis, intestinal putrefactive toxemia and in cases in which a focus of infection is believed to reside in the bowel, as in certain cases of rheumatism, neuritis, secondary anemia and sundry run-down conditions. There are many other acute and chronic conditions in which an irrigation may be found useful, but of these I have omitted discussion.

In recapitulation: 1. A colon irrigation is a process of lavage to be distinguished from an enema. 2. It is given to dilute and wash out the contents of the bowel above the normal defecation area, to soften and loosen abnormal mucus and to lavage the colon wall. 3. It leaves the colon more or less empty and contracted and thus exerts a beneficial effect on its blood supply and its tone. 4. It should be preceded by defecation and should be administered very slowly and without much pressure. 5. The one tube and two tube methods are employed, the tubes being inserted not more than 6 inches. 6. The high insertion of a large rather stiff tube is dangerous and without proved advantage. 7. The dangers of the stiffer tube are perforation, injury to a polypus, tearing of a rectal valve, and abrasion of the wall. 8. The charges that irrigations do harm by removing normal mucus, by lowering the tone of the bowel and by producing colitis are without foundation. 9. An irrigation is frequently a failure in the hospital ward and in the hands of the unspecialized nurse.

I trust that my warnings against its improper administration, its dangers and its abuse will not discourage physicians in the proper utilization of this valuable therapeutic measure.

33 East Sixty-Eighth Street.

1. The following references are suggested for further reading:
Alvarez, W. C., and Freedlander, B. L.: Rate of Progress of Food Residue Through the Bowel, J. A. M. A. **82**: 876 (Aug. 23) 1924.
Fineman, S., and Snyder, R. G.: Clinical and Roentgenologic Study of High Colonic Irrigation as Used in Therapy of Subacute and Chronic Arthritis, Am. J. Roentgenol. **17**: 27-43 (Jan.) 1927.
Dragstedt, C. A., and Nisbet, O. M.: Intestinal Antiseptics, J. Lab. & Clin. Med. **8**: 190-193 (Dec.) 1922.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

HYGEIA PURE STRAINED CARROTS

Contains Vitamin D

Added Irradiated Ergosterol (Mildly seasoned with salt)

Manufacturer.—Snider Packing Corporation, Rochester, N. Y.

Distributor.—Hygeia Nursing Bottle Company, Buffalo, N. Y.

Description.—Strained carrots retaining in large measure the mineral and vitamin content of the raw carrots used; with added vitamin D (irradiated ergosterol), 60 D units per fluidounce; packed in jars. The D units are those defined by the Council on Pharmacy and Chemistry of the American Medical Association (New and Nonofficial Remedies, 1931, p. 414). One fluidounce is equivalent in vitamin D to the D content of one teaspoonful of cod liver oil. Mildly seasoned with salt.

Manufacture.—The carrots are purchased locally and graded for size and the larger carrots used. The carrots are steamed to facilitate the removal of the skins and then mechanically peeled. The peeled carrots are inspected, further trimmed if necessary, diced, filled into No. 10 cans and a hot brine solution (87 C.) is added. The cans are sealed and processed for forty-five minutes at 115 C.

The canned carrots in the preparation for puréeing are treated essentially as described for Strained Peas. The liquid content of the can is strained off and not used for puréeing, which eliminates most of the salt. The processing is that described for the Strained Peas. Irradiated ergosterol is incorporated in the product, as described for Strained Peas.

Analysis (submitted by manufacturer).—

Specific gravity 20 C./20 C.	1.03
	per cent
Moisture	93.9
Total solids	6.1
Ash	0.7
Fat (ether extract)	0.2
Protein (N × 6.25)	0.6
Reducing sugars after inversion as dextrose	2.6
Starch (acid hydrolysis method)	0.4
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	4.0
Calcium (Ca)	0.03
Iron (Fe)	0.001
Phosphorus (P)	0.01

Calories.—0.2 per gram; 6 per ounce.

Vitamins and Claims of Manufacturer.—See these sections for Strained Peas (THE JOURNAL, Feb. 13, 1932, p. 555).

U-COP-CO GELATINES

(Flaked and Granulated)

Manufacturer.—United Chemical and Organic Products Company, Chicago.

Description.—Granular and flake plain unsweetened gelatin; graded on the basis of jelly strength for special uses.

Manufacture.—U-Cop-Co Gelatine is made entirely from porkskin trimmings and "osseine" prepared from packer bone, from animals slaughtered solely for human consumption under the supervision of government inspectors. The fresh skins are frozen and stored under refrigeration until used. The stock drawn from refrigeration is washed and thawed in running water. Arsenic free hydrochloric acid is added to "plump" the stock and prepare it for cooking. The acid is neutralized and washed out. The stock is placed in cooking tanks and extracted by successive additions of hot distilled water. The separate gelatin solution extracts are clarified by passing through aluminum presses containing activated carbon and a diatomaceous "filter aid,"

For the granulated gelatin the clarified liquor is jelled on a rubber belt which passes through a refrigerated tunnel. The jelly is mechanically deposited on aluminum netting, dried by warm filtered air, and the dried gelatin is milled to a suitable granulation.

For the flake gelatin the clarified liquor flows on a large rotating wheel the surface of which is maintained by steam at a temperature above 100 C. The gelatin liquor is dried during one rotation of the wheel in approximately one minute. The dry film is scraped from the wheel by knives and the resulting flakes are broken up in a mill.

For certain special purposes, U-Cop-Co Gelatine is made from "osseine" prepared from edible packer bone. The bone is ground, the fat is extracted with light gasoline and the mineral matter with dilute hydrochloric acid. The organic residue or "osseine" is prepared for cooking by steeping in dilute lime water for three or four weeks. The lime is removed by the addition of dilute hydrochloric acid and washing in water. The subsequent washing, cooking and other treatments are substantially the same as described for the "porkskin" trimmings.

The different granular and flake gelatin grades intended for special uses are prepared by blending in definite proportions the gelatin from the several extractions, which respectively have different properties in jelly strength, viscosity, clearness, melting point, etc. These different properties adapt the various grades for particular uses.

All possible precautions are observed to prevent bacterial contamination of the gelatin. The equipment is thoroughly cleaned between runs. All pipe lines are either aluminum or nickel. Storage tanks for the gelatin liquor are glass lined. All operations are under laboratory control. Each lot of gelatin is separately tested.

Analysis (submitted by manufacturer).—

	per cent
Moisture	10.0
Ash (approximately 80 per cent sodium chloride)	1.2
Fat (ether extract)	0.0
Protein (N × 5.55)	88.5
Carbohydrates	0.0
Jelly strength of different grades (Method of the Edible Gelatin Manufacturers Research Society of America)	50 to 275 Bloom
	(parts per million)
Arsenic (As)	0
Copper (Cu)	less than 5
Zinc (Zn)	less than 5
Lead (Pb)	0
Sulphur dioxide (SO_2)	0
Added preservatives	none

Calories.—3.5 per gram; 99 per ounce.

Micro-Organisms.—The manufacturer guarantees absence of Bacillus coli, liquefying and gas forming bacteria and pathogenic organisms.

Claims of Manufacturer.—U-Cop-Co Gelatines may be used in a wide variety of desserts, candies, salads, marshmallows, ice cream, jellied meats and other recipes and are valuable for many special diets.

FREIHOFER'S 100 PER CENT WHOLE WHEAT BREAD

Manufacturer.—The Freihofer Baking Company, Philadelphia.

Description.—A whole wheat bread made by the straight dough method.

Manufacture.—The dough ingredients, a mixture of whole wheat flour, water, salt, sucrose, lard, vinegar, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, are mixed in a high speed mixer. The dough is fermented for about one and three-quarter hours, is folded, fermented twenty minutes, folded, fermented fifteen minutes, divided, molded, panned, baked about forty minutes, cooled, and wrapped in wax-paper. The factory, equipment and storage rooms for the materials used are kept in strictly sanitary condition.

Analysis (submitted by manufacturer).—

	per cent
Moisture (entire loaf)	36.8
Ash	2.1
Fat (acid hydrolysis method)	2.2
Protein (N × 6.25)	10.5
Crude fiber	1.6
Carbohydrates other than crude fiber (by difference)	46.8

Calories.—2.5 per gram; 71 per ounce.

Claims of Manufacturer.—A bread of good quality.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 27, 1932

THE TESTICULAR HORMONE

Experimental and clinical evidence, as well as numerous studies of transplantations, indicates clearly that the testes possess one or more endocrine functions. The experimental evidence of the presence of an internal secretion of the testes has been based primarily on the effects observed on the removal of the testes. Although it has been stated from time to time that extracts of testicular tissue when injected into castrated animals produce various effects, many of which are associated with secondary sex characters, most workers in endocrinology have not accepted these statements because the criteria used for determining the effects of the extracts on castrated animals were of doubtful value. Probably the first report giving clear cut evidence of extracting and fractionating the hormone from testis tissue was given by McGee,[1] who obtained a lipin fraction from bull's testis which, when injected intramuscularly into brown leghorn capons, caused a remarkable growth of the comb, wattles and ear lobes. The response is prompt, increase in the size of the comb can be observed in from one to three days after the injection, and when the injections are discontinued the regression of the comb to the capon type takes place rapidly.

Most extensive studies of the action of the testicular hormone have been made by Moore [2] and his co-workers. He has developed several different mammalian tests for the presence of the hormone. The foundations for the criteria used in the mammalian tests were laid by the earlier studies of Moore and his students on the various effects observed as the result of castration of the rat and the guinea-pig. Earlier observations by Moore and Benoit [3] showed that the intact testis in situ or a cryptorchid testis prolongs the time of motility of the spermatozoa found in the epididymis. In the case of the completely castrated guinea-pig with the epididymis left intact, the spermatozoa never retained their motility beyond twenty-three to twenty-five days following castration, but by injection of the testis extract into the guinea-pig the time of motility of the spermatozoa was distinctly prolonged, the longest time being fifty-four days. The second mammalian test for the presence and action of the testicular hormone is the electrical ejaculation test. This test, originally discovered by Batelli in 1922, consists in causing the animal to ejaculate semen by an electrical stimulus through the brain. A normal guinea-pig if thus tested once a week yields a secretion of from 1.5 to 2 Gm. The material consists of secretions from the prostate and seminal vesicles and is distinctly fluid as ejaculated, but it soon coagulates to a firm jelly as a result of the coagulating enzymes present in the prostatic secretion. In the guinea-pig several weeks after castration these secretions are no longer normal; the result is that little or no material is ejaculated when the test is applied, and whatever material is secreted is exceedingly small and does not coagulate. Moore and Gallagher [4] have shown that if a castrated guinea-pig is injected with the testicular extract the loss of secretory function of both the seminal vesicles and the prostate can be corrected in that the secretion is near to the normal in amount and possesses the normal characteristics of the fluid. They have even taken an adult guinea-pig which has been castrated for six months and in which the ejaculation test had been found negative for some time and after from ten to fourteen daily injections of the extract obtained a normal ejaculation. The third mammalian test applied by Moore, Price and Gallagher [5] is that of the testis control on the cells of the prostate. In the castrated animal the entire prostate usually diminishes appreciably in size and rapidly shows striking degenerative and atrophic changes. These workers have shown that they can maintain the normal conditions of the cells of the prostate by daily injections of the hormone into the castrated animal. They have, in fact, stimulated the development of an apparently normal adult prostate in a prepubertally castrated rat 100 days old.

The fourth mammalian test applied by Moore, Hughes and Gallagher [6] is that of the testis control on the cells of the seminal vesicles of the rat. Here again it is now well known that the size and the cells of the seminal vesicles are controlled by the testes. In castrated animals, both of these are restored to the normal picture by the daily injections of the hormone. The same authors have also stimulated the production of the histologically normal adult seminal vesicle in the prepubertally castrated rat by injections of the hormone.

The studies thus far seem to indicate that from a qualitative point of view the comb growth reaction and

1. McGee, L. C.: Proc. Inst. Med. Chicago **6**: 242, 1927.
2. Moore, C. R.: Proc. Soc. Exper. Biol. & Med. **24**: 847, 1927; J. Exper. Zool. **1**: 455 (April 5) 1928. The Regulation of Production and the Function of the Male Sex Hormone, J. A. M. A. **97**: 519 (Aug. 22) 1931.
3. Benoit: Univ. Strasbourg thesis, 1925.
4. Moore, C. R., and Gallagher, T. F.: Am. J. Physiol. **89**: 388 (July) 1929; Am. J. Anat. **45**: 39 (Jan.) 1930.
5. Moore, C. R.; Price, Dorothy; and Gallagher, T. F.: Am. J. Anat. **45**: 71 (Jan.) 1930.
6. Moore, C. R.; Hughes, Winifred; and Gallagher, T. F.: Am. J. Anat. **45**: 109 (Jan.) 1930.

the mammalian cytologic tests are of about the same order of delicacy. The spermatozoa motility test is approximately ten times as sensitive as the comb growth method, and the ejaculation test is the least delicate of all.

After this substance had been found in bull's testis, it was deemed important to determine that the substance is specifically present in testicular tissue and not possibly a general extractive that may be found in various tissues. Thus far this substance has been found in bull calf, embryonic calf and hog testicles. Gallagher [7] examined other bull tissues and found the hormone in only one other organ, the epididymis. He repeatedly obtained negative results from bull blood, although recently Womack and Koch [8] obtained evidence of its presence when the equivalent to that obtainable from 600 cc. of bull blood was injected into capons daily. Loewe and Voss,[9] as well as Funk, Harrow and Lejwa,[10] found it in human male urine. Womack and Koch have also found the hormone in adult male and female urine but not in the urine from boys under 10 years of age. The source of the hormone in adult female urine is a mystery. Loewe and his co-workers also report detecting the hormone in the male blossoms of Salix caprea.

It at once became apparent to these workers that in order to make progress in the purification of this extract it would be necessary to have a quantitative method for determining the amount; and as there are at present no chemical methods of measuring it, biologic effects for assay must be used. Thus far the quantitative assay of preparations of testicular hormone has been limited to comb growth and seminal vesicle tests. Gallagher and Koch [11] have studied the former reaction in detail and conclude that the increase in comb size is a reliable quantitative criterion provided the growth is obtained in five days, is the average from five birds, and as expressed in increase in length plus increase in height is from 3 to 7 mm. and preferably 4 to 6 mm. They define their bird unit as the amount of hormone which, when injected intramuscularly daily for five days, causes an average of 5 mm. in the sum of the increase in length and height of the comb of at least five brown leghorn capons. Womack, Koch, Domm and Juhn [12] recently showed that the growth response to a given dose of the hormone in the capon is influenced by the amount of light to which the bird is exposed.

The mammalian tests are at present not as suitable for quantitative assays as the comb growth method. The rat unit of the male hormone as determined by Moore and his co-workers [13] is defined as the minimal daily amount required to maintain 50 per cent of castrated animals in a normal condition, the index being normal prostate and seminal vesicle. Twenty days after castration has proved to be sufficient time for the injections to express their true potency.

While the exact chemical nature of the hormone is not known, some of the chemical properties have been determined. It is found in the lipoid fraction and in general can be fractionated by methods similar to those employed for the female sex hormones. The material is resistant to temperature, acids, alkalis and oxygen. The yield of the hormone is exceedingly low. In the earlier studies it was necessary to inject the equivalent of from one-half to one pound of testicular tissue to make an assay on the capon. With better methods of comb measurement and further purification of material, effects are observed from injections representing much less original tissue. The most active and probably purest preparation thus far obtained is one in which a dose of 0.01 mg. of the active material per capon daily causes distinct comb growth. The product acts best when injected subcutaneously or intramuscularly; the dose for action by mouth is at least ten times as high.

In the light of the results obtained on animals, it is reasonable to suppose that similar results will hold with reference to man. Thus far there has been no indication that the product can be of any value in restoring "vigor" to the aged or neurasthenic. However, if there is an indication for its use and if the dosage in man is comparable to that effective in the capon, the daily injection for a man weighing 150 pounds would have to be an amount equivalent to 5 pounds of bull's testis or 2 gallons of normal male urine. If taken by mouth, the dosage presumably would have to be much larger. These deductions, based on animal experimentation, indicate the probable fallacy of prescribing testis preparations to man.

7. Gallagher, T. F.: Am. J. Physiol. **87**: 447 (Dec.) 1928.
8. Womack, E. B., and Koch, F. C.: Proc. Second International Congress for Sex Research, 1930.
9. Loewe, S., and Voss, H. E.: Klin. Wchnschr. **6**: 500, 1927; Akad. Anzg. der. Akad. d. Wissensch. in Wien, 1929, number 20.
10. Funk, C.; Harrow, B., and Lejwa, A.: Proc. Soc. Exper. Biol. & Med. **26**: 569, 1930; Am. J. Physiol. **92**: 440, 1930.
11. Gallagher, T. F., and Koch, F. C.: J. Pharmacol. & Exper. Therap. **40**: 327, 1930.
12. Womack, E. B.; Koch, F. C.; Domm, L. V., and Juhn, Mary: J. Pharmacol. & Exper. Therap. **41**: 173 (Feb.) 1931.
13. Moore, C. R., and Gallagher, T. F.: J. Pharmacol. & Exper. Therap. **40**: 341 (Nov.) 1930.

DIET AND THE PRODUCTION OF HUMAN MILK

There has never been a time, perhaps, when so much thought and enthusiasm have been concentrated on the problems of infancy and childhood as at present. The recent White House Conference on Child Health and Protection, called by President Hoover, represented the results of months of careful deliberation by many experts from all parts of the country. The chairman of the conference, Dr. Ray Lyman Wilbur,[1] has pointed out that we have injected so many artificial conditions into our industrial civilization that the old normal relationships of mother and child, child and family, family and neighborhood, have been changed. There is now a much less direct struggle with nature and its

1. White House Conference, 1930, New York, Century Company, 1931.

immediate forces than has ever been the situation before in our country. We have softened this struggle for man, Wilbur adds, by all forms of protection—better houses, better clothing, more and better food supplies, preventive medicine, and better medicine and sanitation in general. All of this has called for a delegation of functions, once performed by the individual in the home, to all sorts of outside dependence.

There is a period of life, in infancy, when the rôle of the mother is unquestionably paramount in that she supplies through her maternal tissues the nutrition of her young. The words of Mrs. Rose [2] "Happy the baby who enjoys his inalienable right of Nature's food supply—his own mother's milk" constitute a slogan worth frequent repetition. Modern investigation is disclosing in increasing measure that even mother's milk is susceptible to marked variations. The human mother, like other lactating individuals, is subject to the influence of her own diet, which may be reflected to some extent in the composition of her milk. One cannot study the elaborate investigations of Macy and her co-workers in Detroit [3] without realizing that even human milk is a variable to an extent that must have some varying effects on the young that are dependent on it. In a study made by Hoobler [4] in Detroit in 1917 he reached the conclusion that different types of protein in the maternal ration unmistakably influence the milk produced. Broadly speaking, he maintained that diets rich in proteins, particularly those of animal origin, are beneficial. He insisted that it was not easy to keep human lactating mothers in positive nitrogen balance on diets in which the protein was derived exclusively from vegetable sources. There is always the danger that a mother will "milk the flesh off her back" in the production of her breast milk.

Investigation of the problems of the effect of diet on human milk secretion involves personal difficulties of obvious sorts. It is laborious, and progress will inevitably be slow. Physiology is therefore compelled to consider the contributions to our knowledge that can be made by other species than man. There is an elaborate literature on the mammary secretion of cattle; but the conditions that refer to these vegetarian ruminants are not always applicable to mankind. A recent writer,[5] referring to cows and goats, recalls that they are the result of several centuries of intensive breeding and that the capacity of the mammary gland, and probably their entire metabolism, has been so specialized that we are not able to make direct comparisons of the results in these animals with those on other animals and on human beings, wherein the process of milk secretion has not been so highly developed. Working at the University of Rochester, N. Y., Daggs [5] has investigated the mammary functions of dogs. Balanced diets were fed during the period of lactation, the only variable being the source of the protein. The results indicate that there are conditions in which a degree of betterment in lactation can be brought about by changing the dietary protein. For example, in these experiments liver was a much better source of protein for lactation than either egg or round steak. In fact, his conclusion that liver is the best source of protein (of those tried) for milk production in dogs is borne out by the quantity of milk produced, the fat content of the milk, the nitrogen retention, and the slope of the growth curve of the pups. As far as human experience is concerned, it matters not so much what proteins or dietary factor may for the moment be emphasized in the progress of investigation. The feature of moment is that the problems of human lactation call for extensive research at the earliest opportunity to insure that the "inalienable rights" of the nursling shall be safeguarded by the prepared intelligence of those to whom the responsibility for human well being is entrusted.

2. Rose, Mary S.: Feeding the Family, ed. 3, New York, Macmillan Company, 1929.

3. Human Milk Studies, editorial, J. A. M. A. **97**: 1540 (Nov. 21) 1931.

4. Hoobler, B. R.: The Effect on Human Milk Production of Diets Containing Various Forms and Quantities of Protein, Am. J. Dis. Child. **14**: 105 (Aug.) 1917.

5. Daggs, R. G.: Studies on Lactation: I. Production of Milk in the Dog as Influenced by Different Kinds of Food Proteins, J. Nutrition **4**: 443 (Nov.) 1931.

Current Comment

CALCIUM AND HYPERCALCEMIA

Ever since the discovery that irradiated ergosterol (viosterol) can affect the metabolism of calcium and phosphorus in the body, interest has centered in the mechanism by which the characteristic changes are brought about. Closely related to this problem are the toxic manifestations that can be produced by enormous doses of viosterol. It was early established that this substance can be made to mobilize calcium in such a way as to induce a condition of hypercalcemia. The question arose, therefore, as to whether this condition is due to an enhanced absorption of calcium from the food sources in the alimentary tract or whether the alkali earth is drawn from depots within the organs and tissues. The replies have been contradictory until quite recently. Now, however, a harmony of opinion seems to have been attained. Two independent groups of investigators [1] have demonstrated that hypercalcemia can be brought about, even in the almost complete absence of calcium from the diet, by giving sufficiently large doses of viosterol. As Hess [1] has pointed out, the failure of investigators to bring about this condition and their conclusion that the source of the excess calcium in this form of hypercalcemia is the food and not the tissues is due to the fact that viosterol was given in insufficient amounts. The immediate source of the calcium under the admittedly extreme conditions cited is in the bones, the great storehouse of the element in the body. Hypercalcemia in experimental animals was greatly reduced by intravenous injections

1. Jones, J. H., and Rapoport, M.: Further Observations on the Relation of Calcium and Phosphorus Intake to the Hypercalcemia and Hyperphosphatemia Induced by Irradiated Ergosterol, J. Biol. Chem. **93**: 153 (Sept.) 1931. Hess, A. F.; Benjamin, H. R., and Gross, J.: The Source of Excess Calcium in Hypercalcemia Induced by Irradiated Ergosterol, J. Biol. Chem. **94**: 1 (Nov.) 1931.

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of a solution of sodium bicarbonate. Following reduction by such means, a marked excess of calcium and phosphorus was found in the lungs and the kidneys. These investigations represent extreme conditions so far as the overdosage with viosterol is concerned; nevertheless, they indicate how drafts may be made on the inorganic storehouse of the bones in times of stress. When an abundance of dietary calcium is available under conditions that can favor its ready absorption, the results of hypercalcemia are far less drastic.

EXERCISE AND THE VITAMIN B REQUIREMENT

Few scientific questions in relation to nutrition are of greater interest at present than those relating to the functional rôles of the vitamins. How do these indispensable food factors act in the body, or what specific purposes do they serve? For some of the vitamins the answers seem to be clarifying. In the case of vitamin A, for example, its importance for the maintenance of a perfect nutritive status in some of the epithelial tissues of the body has been well established. When there is lack of the essential substance for any considerable period, keratinization of certain epitheliums inevitably ensues. In view of the stimulating effect of vitamin B on appetite, some of the earlier students of the subject assumed the existence of a relationship between this vitamin and the secretory functions of various glands; but experiment has not substantiated this view. More compelling have been the attempts to connect vitamin B with metabolism, though the actual possible relationships are by no means clear at present. Reviewing the animal investigations of recent years, Sherman and Smith[1] conclude that a pronounced deficiency in vitamin B is followed by failure of appetite, decreased food consumption, and finally starvation, resulting in gastric and intestinal atony, fall of body temperature and death. A serious deficiency of vitamin B in human nutrition, these authors add, will lead to beriberi or, under less drastic conditions, to failure of appetite, possibly minor digestive disturbances, and loss of stamina. In a recent study at Yale University by Cowgill and his collaborators,[2] comparisons were made between the vitamin requirement of resting animals and those of muscular activity. Advantage was taken of the now well demonstrated fact that the capacity for storage of vitamin B in the body is rather limited. In each case of increased exercise the period required for the development of the anorexia characteristic of lack of the vitamin B complex was markedly less than the time required when forced exercise was not given. These observations are considered to support the interpretation that the vitamin B requirement per unit of tissue mass is proportional to the metabolism of that mass. These results also support the observations of other investigators showing a relationship between vitamin B and metabolism. The observations do not solve the question of the possible relation of vitamin B to the metabolism of any particular nutrient.

1. Sherman, H. C., and Smith, S. L.: The Vitamins, ed. 2, New York, Chemical Catalog Company, 1931.
2. Cowgill, G. R.; Rosenberg, H. A., and Rogoff, J.: Studies in the Physiology of Vitamins, Am. J. Physiol. **98**: 589 (Nov.) 1931.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday from 12 noon to 12:05 p. m., over Station WBBM (770 kilocycles, or 389.4 meters) and other stations of the Columbia Broadcasting System, and on Wednesday and Friday from 2:25 to 2:30 p. m., over Station WBBM, Chicago.

The program for the week is as follows:

February 29. Running Water is Not Always Pure.
March 2. First Aid.
March 4. Accidents and Tuberculosis.

There is also a fifteen minute health talk sponsored by the Association on Saturday from 11:15 to 11:30 a. m.

The program for the week is as follows:

March 5. How Mothers Can Help Prevent the Spread of Contagion in School.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Sale of "Koremlu" Forbidden.—Dr. Jacob C. Geiger, director of public health of San Francisco, recently issued an executive order which forbids in that city the sale of Koremlu, a depilatory containing thallium acetate. This action followed a conference of a number of dermatologists practicing in San Francisco and the publication in THE JOURNAL of articles referring to Koremlu. Three cases of retrobulbar neuritis, ascribed to this depilatory, were reported by Dr. William Mahoney, Boston, in THE JOURNAL, February 20, p. 618.

Survey of Typhoid Carriers.—Drs. Arthur Hieronymus and Ralph W. Sanders, health officers of Oakland and Alameda, respectively, recently completed surveys of known typhoid carriers residing in the two cities. Specimens were obtained from all carriers and examinations were made in laboratories to determine whether such individuals are still carriers. Information relative to the compliance of the carriers with regulations for their control was also obtained. It is planned to make similar surveys at least twice each year, according to the bulletin of the state department of health.

Lectures at University.—Dr. Henry E. Sigerist, director, Institute of the History of Medicine, University of Leipzig, Leipzig, Germany, gave three lectures under the auspices of the University of California Medical School. Two of these lectures, "The Evolution of Medical Ethics," January 19, and "Medicine of the Renaissance," January 22, were given in San Francisco, and the third, "Civilization and Disease," January 20, was given in Berkeley. Dr. Willis C. Campbell, professor of orthopedic surgery, University of Tennessee School of Medicine, Memphis, addressed the faculty and students of the medical school, January 23, on "Treatment of Ununited Fractures."

Society News.—At a joint meeting of the Los Angeles County Medical Association and the Los Angeles County Heart Association, February 18, the speakers included Drs. John C. Ruddock and Arthur S. Granger, Los Angeles, on "Treatment of Thyroid Heart Disease" and "Use and Value of Drugs in Heart Disease," respectively. Dr. C. Frederic Fluhmann, San Francisco, addressed a joint meeting of the San Fernando Valley Branch of the county medical society and the Hollywood Academy of Medicine, February 25, on sex hormones in the study of pelvic disease.——Dr. Johannes M. Nielsen addressed the Los Angeles Society of Neurology and Psychiatry, February 24, on "Progressive Spinal Muscular Atrophy."——Dr. Loyal Davis, Chicago, addressed the San Diego County Medical Society, February 9, on "Effects of Various Diagnostic and Therapeutic Solutions on the Spinal Cord and Its Membranes."

CONNECTICUT

Standard Forms for Registration of Births and Deaths.—The bureau of vital statistics, January 1, adopted standard forms for the registration of births and deaths for the use of registrars of the state in accordance with the action of the public health council of the Connecticut Department of Health. This system will aid in the compilation of comparable statistics from state to state and will assist the federal government in compiling uniform statistics for the nation.

Low Mortality Rate.—Connecticut maintained the same low death rate (10.5) in 1931 that it recorded in 1930. The infant mortality rate of 53.9 deaths of infants under 1 year of age per thousand live births is a record low rate. The lowest rate (0.9) in the history of the state was noted for diphtheria. The tuberculosis death rate for all forms (54) is also a record death rate, as is the rate of 73.7 for all the pneumonias. The maternal mortality rate (4.7 per thousand living births) is the lowest rate to appear in the records of the state.

GEORGIA

Society News.—Dr. Thomas P. Goodwyn, Atlanta, addressed the Fulton County Medical Society, Atlanta, Dec. 3, 1931, on "Fractures of the Upper End of the Tibia Involving the Articular Surfaces." The program of the society, January 21, included a paper by Dr. Dunbar Roy on "Some Practical Points in Refraction Based on the Histories of Eighteen Thousand Cases." Dr. Olin S. Cofer spoke, February 4, on "Treatment of Prolapse of the Uterus."——Dr. Roger W. Dickson presented a case of Hirschsprung's disease before the Fulton County Pediatric Society, February 11.——Dr. Robert A. Berry, Americus, has resigned as health officer of Sumter County, it is reported, to enter private practice at Piedmont, S. C.

ILLINOIS

Society News.—The Peoria City Medical Society was addressed, February 11, by Drs. Raymond W. McNealy on "Recent Advances on the Treatment of Fractures"; Samuel J. Fogelson and Arthur J. Atkinson, "Mucin Therapy in Gastric and Duodenal Ulcer," and Charles A. Elliott and M. Herbert Barker, all of Chicago, "Modern Conception of Renal Disease."——At the meeting of the Ogle County Medical Society, Rochelle, January 14, Drs. Chester C. Guy and LeRoy H. Sloan, Chicago, spoke on "Common Surgical Mistakes as Seen by the Pathologist" and "Differential Diagnosis of Substernal Pain," respectively.——Dr. Drew W. Luten, St. Louis, addressed the St. Clair County Medical Society, East St. Louis, February 4, on "Coronary Sclerosis."

Increase in Immunization Work.—According to the state health director, the volume of "preventive practice" in relation to the prevalence of certain diseases subject to control through vaccination and diagnosis by laboratory procedure increased in Illinois during 1931. The amount of toxoid and toxin-antitoxin distributed by the department indicates that twenty-one children were immunized against diphtheria for each case reported in 1931, against sixteen to one in 1930, and eleven to one in 1929. For each case of smallpox fifty-four persons were vaccinated in 1931 compared with fifteen per case in 1930 and twenty-one per case in 1929. Against typhoid, twenty people were vaccinated per case in 1931 compared with twenty-one per case in 1930 and twelve per case in 1929. The diagnostic laboratories of the department of health examined for typhoid thirteen specimens per case reported in 1931 compared with 9.5 per case in 1930. For diphtheria there were 2.5 specimens per case examined in 1931 compared with 1.4 per case in 1930. The rate for tuberculosis was 1.5 specimens per case in 1931 and 1.4 in 1930. For these three diseases 40,155 specimens were examined during 1931 against 35,984 in 1930, although the aggregate number of cases reported declined from 18,997 to 16,667.

Chicago

Search for Precocious Students.—Northwestern University is conducting a search for precocious students who meet all university requirements but who are from 13 to 15 years of age. The announcement states that while the problem of what to do with the precocious child after graduation from high school is recognized, no university has attempted to approach the problem by evolving a special program for such students. By precocious, it was pointed out, is implied an intelligence quotient of more than 130 or such youthful attainments as were characteristic of Jeremy Bentham, who wrote Greek and Latin at the age of 5 and prepared to enter Oxford at 10; Benjamin Franklin, publisher of a newspaper at 17, and George Washington, a professional surveyor at 15. Special provisions will be made to meet the needs of the superior students at Northwestern. There are two such students in the school at present, but it is felt that they have lacked an adequate environment. It is planned to offer this environment to the students next year. Of the four precocious students who have entered the university, one is the author of several novels and many short stories and is now editor of two magazines, and one recently was awarded a Rhodes scholarship to Oxford University. A letter has been sent to a selected list of high school principals apprising them of Northwestern's desire to aid the precocious student.

INDIANA

Personal.—By the will of the late Dr. Daniel L. Miller, Goshen, $4,000 is to be invested in securities, the income to be used for twenty years in providing Christmas dinner for needy children, after which the principal will go to Goshen Hospital for paying hospital expenses of poor persons.——Josiah K. Lilly, Sr., president of Eli Lilly and Company for thirty-four years, will retire as president, it has been announced. During the World War, the firm outfitted a base hospital corps for service, Mr. Lilly personally contributing $15,000 to this project.

Graduate Course.—A graduate course in otolaryngology will be given at Indiana University School of Medicine, Indianapolis, April 18-30. The course, which will be under the supervision of Dr. John F. Barnhill, will be supplemented by clinical demonstrations and operations during the morning hours. Time will be spent in the anatomic laboratories in the afternoon and evening. Completion of the course will give a total of eighty-four hours of anatomic study and thirty-six hours of clinical instruction and observation. The fee for the course will be $75, which covers the cost of anatomic material. Further information may be had from Dr. Willis D. Gatch, acting dean of the medical school.

Society News.—At the meeting of the Tri-County Medical Society in Columbus, Dec. 17, 1931, Dr. John W. Carmack, Indianapolis, spoke on "Upper Respiratory Infections."——Dr. George A. May, Madison, addressed the Jefferson County Medical Society, January 25, on acidosis.——The Wabash County Medical Society, North Manchester, heard Dr. Louis A. Sandoz, South Bend, discuss skin disease, January 7.——The Elkhart County Medical Association was addressed, January 7, by Dr. Charles O. McCormick, Indianapolis, on "Rectal Ether Analgesia in Obstetrics."——A symposium on prostatic diseases was conducted before the Cass County Medical Society at Logansport, January 22.——The Jackson County Medical Society was addressed at Seymour, January 7, by Dr. Frank M. Gastineau, Indianapolis, on "Some Phases of Syphilis."——The Wells County Medical Society was addressed at Bluffton, February 2, by Drs. William O. McBride and Juan Rodriguez, Fort Wayne, on "Sinus and Middle Ear Infection."——Dr. Hiram E. Ross, Danville, Ill., addressed the Fountain-Warren Medical Society at Williamsport, February 4, on "Skull Fractures—Early Care and Treatment."——At a meeting of the Huntington County Medical Society, February 2, Dr. Lloyd L. Ely, Indianapolis, spoke on "Diabetic Diets."——The Daviess-Martin Medical Society was addressed, January 26, by Dr. Robert G. Moore, Vincennes, on "Observations of Chronic Diseases of the Chest."——Dr. Louis H. Clerf, Philadelphia, addressed the Tippecanoe County Medical Society, February 11, on "Bronchoscopic Aid in the Diagnosis and Treatment of Pulmonary Diseases."

KENTUCKY

Society News.—The Jefferson County Medical Society was addressed, February 15, by Drs. William L. Sneed and James J. King, New York, on "Treatment of Delayed Union in Fractures and of Ununited Fractures" and "Treatment of Brain Abscess," respectively.——Dr. Milton W. Williamson, Atlanta, Ga., has been appointed health officer of Green County to succeed Dr. Agnes M. C. Locke, Greensburg, resigned.——Drs. Leslie H. Winans and Samuel C. Smith addressed the Boyd County Medical Society, Ashland, February 1, on diseases of the chest and diseases of the kidney, respectively.

Illness Among School Children.—Forty children, two teachers and the janitor at the Snyder School, Owensboro, became ill within twelve hours recently, with nausea, vomiting and diarrhea as symptoms. The investigation disclosed that only part of the sick children had eaten the lunch served at school. Analysis of the water showed some Bacillus coli present, but of insufficient quantity to cause the illness. According to Dr. George L. Thompson, Owensboro director, Daviess County Health Department, February 16, the investigation indicated the illness may have been caused by gas from the school furnace.

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Bills Introduced.—H. 604 proposes to reduce to not more than $10 the annual occupational tax required of physicians, surgeons or dentists in cities of the first class. H. 633 proposes to make it unlawful for any person habitually to use morphine, cocaine, eucaine, heroin, or other derivatives of opium or coca leaves, except as prescribed by a licensed physician in the course of treatment. H. 634 proposes to make it unlawful for any person to possess, sell, manufacture or distribute in any other than its natural state any marihuana, Indian hemp or hasheesh, "except under the direction and in the course of treatment by a licensed physician."

MARYLAND

Society News.—The Johns Hopkins Medical Historical Club was addressed, February 15, by Col. Fielding H. Garrison on "The Children of Robert and Clara Schumann: A Study in Family History," and Dr. Lewellys F. Barker, Baltimore, "Medicine in Soviet Russia."——Dr. Arthur M. Shipley, Baltimore, discussed the film "Traumatic Surgery of the Extremities," which was shown before the Baltimore County Medical Society, February 17.

Personal.—Roscoe Raymond Hyde, Ph.D., has been appointed professor of immunology at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore. The position was left vacant last May by the death of Dr. Carroll G. Bull. Dr. Hyde has been connected with the School of Hygiene and Public Health since its beginning in 1918 and was associated with Dr. Bull as senior associate in immunology until 1928, when he took over the work of the department of filtrable viruses.——Dr. Joseph Pokorny, connected with the Baltimore City Health Department, has been appointed coroner at large and assigned to the investigation of automobile fatalities.

MASSACHUSETTS

Bill Enacted.—S. 35, approved by the governor, February 8, has been enacted as Chapter 8, Laws of 1932. The new law amends the prior law with respect to the necessary qualifications for membership on the Board of Registration in Medicine by requiring members to be registered as qualified physicians under the Massachusetts law and omitting the provisions of the prior law specifically stating that members be graduates of a legally chartered medical college or university.

Society News.—At the third annual meeting of the New England Obstetrical and Gynecological Society in Boston, Dec. 2, 1931, Dr. Edward S. Brackett, Providence, R. I., was elected president, and Dr. Joseph W. O'Connor, Worcester, secretary. ——Dr. Homer F. Swift, New York, addressed the New England Pediatric Society, Dec. 11, 1931, on "Recent Progress in Research Work in Connection with Rheumatic Fever."——A joint meeting of the Greater Boston Medical Society and the Beth Israel Hospital was addressed, Dec. 9, 1931, by Drs. Moses Swick, New York, on "Intravenous Urography as a Diagnostic Aid," and Ernest Granville Crabtree, "Practical Applications of Intravenous Urography."——Dr. Thomas F. O'Brien, Worcester, addressed the Webster-Dudley Medical Club in Webster, Dec. 16, 1931, on "Conduct of Normal Labor."——Dr. John F. Fulton, Jr., New Haven, Conn., addressed the Harvard Medical Society, Dec. 8, 1931, on "Evolution of the Babinski as Illustrated in the Monkey, Baboon and Chimpanzee."——Michael M. Davis, Ph.D., Chicago, addressed a joint meeting of the Boston Medical Library and the Suffolk District Medical Society, January 27, on "Paying Your Sickness Bills."——The Norfolk District Medical Society was addressed, January 26, by Drs. Frederick W. O'Brien on "Natural and Artificial Light in the Treatment of Tuberculosis"; Albert Ehrenfried, "Artificial Pneumothorax and Phrenicectomy," and Samuel C. Cline, "Nose and Throat Conditions in Tuberculosis."

MICHIGAN

Orthopedic Association Organized.—The Orthopedic Association of Michigan was recently established, principally for the purpose of cooperating with the State Commission for Crippled Children in the care of indigent cripples from all parts of the state. Provision has been made in the association for associate members who must have had some training in orthopedic surgery but who do not necessarily devote their full time to this specialty. Their function is to cooperate in the after-care of the cripples, but they are not yet allowed to carry out any operative procedures, according to the *Journal of Bone and Joint Surgery*. The group of physicians who organized the association are Drs. Carl E. Badgley, William E. Blodgett, Frank E. Curtis, Robert V. Funston, Angus G. Goetz, Frederick C. Kidner, Alfred D. La Ferté, Charles W. Peabody, Frank H. Purcell, Daniel M. Stiefel, Detroit, Vernon L. Hart, Ann Arbor, and John T. Hodgen, Grand Rapids.

Dr. Clark Honored.—Dr. John E. Clark, Detroit, was guest of honor at a luncheon given by the "Seniors Club" of the Wayne County Medical Society, February 12, in the society's new home. Dr. Clark has been county chemist for thirty-five years. He joined the Wayne County Medical Society in 1878 and is the oldest living member. The tribute to Dr. Clark was in recognition of his contribution to the health of the community during the past half century, as well as for his untiring efforts to aid organized medicine in Michigan. Dr. Louis J. Hirschman was toastmaster at the luncheon, which was attended by seventy-three physicians. Dr. Harry W. Plaggemeyer, president of the Wayne County Medical Society, presented a life membership to Dr. Clark. The speakers included Dr. Oscar S. Armstrong, who graduated with Dr. Clark from the University of Michigan Medical School, 1877, and Dr. Walter J. Cree, who is Dr. Clark's oldest living student.

MINNESOTA

Chiropractor Sentenced.—Frederick I. Sheldon, Minneapolis, licensed chiropractor, pleaded guilty, February 2, to a charge of practicing medicine without a license. Sheldon was sentenced by Judge Reed of the district court to a term of three months in the Minneapolis workhouse. The sentence was stayed for one year.

Society News.—Dr. William W. Duke, Kansas City, Mo., will address the Hennepin County Medical Society, Minneapolis, March 7, on allergy. Dr. James S. McCartney, Jr., Minneapolis, gave demonstrations of pathology of the liver before the society, February 24, and Marjorie Taylor, director, Milwaukee Curative Workshop, spoke on "Place of the Curative Workshop in the Community." Dr. Leo M. Czaja, Chicago, addressed the society's meeting, February 17, on "Maggot Treatment of Osteomyelitis."

MISSISSIPPI

Bill Introduced.—H. 273 proposes to authorize the board of supervisors of any county to contract with a hospital for the medical and surgical treatment and hospitalization of the poor of the county, provided that not more than $2.50 a day for each patient may be so expended by the board.

NEW HAMPSHIRE

Personal.—Dr. Alphonse Wilfred Petit, Nashua, was the guest of honor at a dinner and reception given by citizens of Nashua, January 7, celebrating his completion of fifty years of medical practice in that city. Dr. Petit was graduated from Victoria University Medical Department, Montreal, in 1877, and came to Nashua in December, 1881.

NEW JERSEY

Tribute to Dr. Danzis.—The medical staff of Newark Beth Israel Hospital gave a dinner, February 11, in honor of Dr. Maximillian Danzis, chief of staff, marking his completion of thirty years' service to the institution. An oil painting of Dr. Danzis was presented to the hospital by Dr. Charles M. Robbins on behalf of the staff and accepted by Frank I. Liveright, president of the board of directors. Dr. Paul Keller, executive director of the hospital, presided; among the speakers were David I. Kelly of the Essex County Park Commission and Dr. Wells P. Eagleton. Dr. Danzis was born in Russia in 1874, and came to Newark in 1890.

Bills Introduced.—S. 98, to amend the workmen's compensation act, proposes to add pneumoconiosis to the list of compensable occupational diseases. S. 138, to amend the dental practice act, proposes that the certificate of the board of registration and examination in dentistry that the records of the board show or fail to show the issuance of a license to practice dentistry, or of an annual certificate of registration, shall be prima facie evidence of those facts in proceedings in which the board may be a party. S. 150 proposes to permit any trial judge, whenever in his opinion it may be necessary to settle the issues of any pending cause, to appoint, on his own motion, or on the motion of either party to the action, one or more disinterested expert witnesses. The appointment of such expert witnesses by the court is not to prevent either party from calling its own expert witnesses. A. 170, to amend the dental practice act, proposes (1) to add to the causes for which licenses may be revoked (*a*) conduct unbecoming dental practitioners, (*b*) violation of any rules or regulations promulgated

by the board; (2) to permit notices of revocation proceedings to be served by registered mail; (3) to raise the annual registration fee required of dentists to $3, and (4) to prohibit the practice of dentistry by corporations. A. 172, to amend the pharmacy practice act, proposes to discontinue the licensing of assistant pharmacists. A. 174 proposes to authorize the board of medical examiners to create a division to be known as the "Division of Medicinal Liquor," and to promulgate such regulations as will allow licensed physicians to use their own judgment as to amount necessary in the prescribing of intoxicating liquor for medicinal purposes. A. 176 proposes that marriage licenses shall not be issued when either of the contracting parties at the time of making the application is infected with a venereal disease in a communicable stage; is an imbecile, epileptic or of unsound mind; or is or has been an inmate of an insane asylum, unless it appears that such person has been discharged as cured from the asylum. A. 224, to supplement the pharmacy practice act, proposes to limit the use of the terms "pharmacy," "drug store," "apothecary shop," etc., to places supervised by registered pharmacists. A. 253 proposes to establish a Department of Hospitals and Charities and to consolidate therein the Commission for the Amelioration of the Condition of the Blind, Board of Children's Guardians, Rehabilitation Clinics of the Department of Labor, Commission for the Rehabilitation of Physically Handicapped Persons and Boards of Managers of Institutions. A. 257 proposes to establish a Department of Health to succeed to and exercise all the rights and powers and to discharge all the duties now exercised and charged on the State Board of Health. A. 325, to amend the law regulating the practice of chiropody, proposes that the fitting, recommending or the sale of corrective shoes, arch supports or similar mechanical appliances by retail dealers shall not be deemed to be the practice of chiropody. A. 334, to amend the laws regulating the practice of chiropractic, proposes to authorize the board of medical examiners to permit any veteran of the World War, having the educational requirements specified by statute, to be licensed without examination to practice chiropractic.

NEW YORK

Personal.—Mr. Harvey J. Hill, White Plains, who originated the plan of the annual Red Cross roll-call, died suddenly, January 28, at the age of 51.——Dr. Charles C. Murphy, Amityville, president of the Suffolk County Medical Society, has accepted the chairmanship of the Suffolk County committee of the American Society for the Control of Cancer.

Society News.—Dr. Aaron S. Blumgarten, New York, spoke on "Practical Endocrinology," before the Nassau County Medical Society, Mineola, January 26.——Three papers on coronary diseases were presented before the Medical Society of the County of Albany, at Albany, January 20, by Drs. Charles A. Perry, James F. Rooney and Arthur W. Wright.——Dr. Joseph A. Johnston, Detroit, addressed the Saranac Lake Medical Society, February 3, on "Studies in Carbohydrate Metabolism."

Bills Introduced.—A. 895 proposes to permit a divorce, among other causes, where either spouse is insane or is physically incapacitated. A. 949 proposes to modify the limitations placed by law on the practice of physical therapy by technicians by allowing such technicians to use in the treatment of diseases, without the supervision of a licensed physician, actinotherapy, hydrotherapy, mechanotherapy, thermotherapy and electrotherapy, exclusive of the roentgen ray, and to diagnose and prescribe therefor. A. 1040 proposes to permit either spouse to institute proceedings to annul a marriage by reason of the lunacy of the other spouse.

New York City

Society News.—Dr. Samuel Weiss demonstrated a photographic gastroscope and showed a color film depicting the normal and abnormal states of the stomach before the New York Physicians Association, January 27.——Drs. Emil Koffler and Nathan B. Van Etten addressed the Bronx County Medical Society, February 17, on "State Health Insurance in European Countries" and "Recent Evolutions of Economics of Medical Service," respectively.——Dr. Salvatore di Palma gave a lecture under the auspices of the Medical Society of the County of Queens, February 5, on "New Treatment of Nonseptic Incomplete Abortions." Dr. Adolph G. De Sanctis gave a lecture on "Convulsions in Infancy and Early Childhood," February 19.——Drs. Thomas M. Rivers and Robert T. Frank addressed the Medical Society of the County of Kings, February 16, on "Nature of Viruses" and "Gynecological Conditions and Their Treatment in Children and Adolescents," respectively.——Drs. Martin E. Rehfuss, Philadelphia, and John B. D'Albora addressed the Medical Association of the Greater City of New York, February 15, on "Medical Treatment of Gallbladder Disease" and "Treatment of Ulcerative Colitis," respectively.

Friday Afternoon Lectures.—The Medical Society of the County of Kings has announced the program of its spring series of Friday afternoon lectures to be given at McNaughton Auditorium in Brooklyn. The speakers with their subjects are as follows:

Dr. Harrison S. Martland, Newark, N. J., "Pathology of the Heart," March 4.
Dr. Samuel A. Loewenberg, Philadelphia, "Differential Diagnosis of Acute Abdominal Conditions," March 11.
Dr. Theodor Blum, Manhattan, "More Common Diseases of the Teeth and Jaws," March 18.
Dr. I. Harris Levy, Syracuse, "Cancer of the Stomach," April 1.
Dr. Bernard Samuels, Manhattan, "Common External Diseases of the Eye and Their Treatment," April 8.
Dr. Dean Lewis, Baltimore, "Osteomyelitis," April 15.
Dr. Ernst P. Boas, "Treatment of Circulatory Failure," April 22.
Dr. Israel Strauss, "Neurological Diagnosis in General Medicine," May 6.
Dr. Louis E. Phaneuf, Boston, "Diagnosis and Management of Uterine Bleeding," May 13.

Medical Publications of Washington's Time.—As a contribution to the celebration of the two hundredth anniversary of the birth of George Washington, the Medical Society of the County of Kings has placed on exhibition in its library the writings of some of Washington's medical contemporaries. Best known among them are Benjamin Rush (1745-1813), a surgeon general of military hospitals during the Revolution and a signer of the Declaration of Independence; and Samuel Bard (1742-1821), first professor of the theory and practice of physic at King's College (now Columbia University), who was physician to Washington during his residence in New York as president. John Jones (1729-1791), a surgeon in the Revolutionary Army and first professor of surgery in King's College, was the author of the first medical book by an American writer, a treatise on the care of wounds and fractures, which is included in the exhibit. John Morgan (1735-1789), director general and physician-in-chief of the American Army, 1775-1777, who wrote the first brief for adequate medical education in the United States, and William Currie (1754-1828), an army surgeon who wrote some of the earliest works on epidemiology, are others whose writings are shown.

OHIO

Personal.—Dr. William H. Stroup, Spencer, recently retired as president of the town board of education after forty-two years of continuous service in that capacity.——Dr. John G. Anderson, Fayetteville, has been appointed health officer of Brown County to succeed Dr. William L. Faul, Russellville, who retired from active service.—Dr. William F. Moss, Maineville, was the guest of honor at a dinner, February 6, marking his fiftieth year in the practice of medicine.

Society News.—The Marion Academy of Medicine was addressed, February 3, among others, by Drs. John A. Dodd, Richard T. Morgan, Everett H. Morgan and Harold K. Mouser. The general topic for discussion was shock.——The Miami Valley Hospital, Dayton, has recently established a diabetic clinic, in charge of Drs. Benedict Olch and Thomas P. Sharkey.——Dr. Joseph H. Barach, Pittsburgh, addressed the Mahoning County Medical Society, Youngstown, February 16, on "High Arterial Pressure: Etiology, Classification and Treatment." Dr. John P. Tucker, Cleveland, will speak, March 15, on "Newer Viewpoints in the Treatment of Peptic Ulcer."——Dr. Frank W. Harrah, Columbus, addressed the Knox County Medical Society, Mount Vernon, January 28, on "Preoperative and Postoperative Care of the Prostatic Patient."——Dr. Mark H. Mothersill, Indianapolis, discussed "Recent History in the Treatment of Anemia" at a meeting of the Preble County Medical Society, February 18.——Drs. Harold A. Miller, Maurice E. Hodgdon and William Paul Dodds, of Pittsburgh, conducted a symposium on "Common Obstetrical Difficulties and Treatments" before the Belmont County Medical Society, February 4.

OKLAHOMA

Dr. Sigerist to Lecture.—Dr. Henry E. Sigerist, professor of the history of medicine and director of the Institute of the History of Medicine, University of Leipzig, Germany, will give two addresses in Oklahoma City, February 29, as the guest of the University of Oklahoma School of Medicine and the Oklahoma County Medical Society. His subjects will be "Medicine of the Renaissance" and "Medicine and Humanism."

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PENNSYLVANIA

Eyesight Swindlers.—Two men calling themselves "Dr." Harris and "Dr." Sherman are reported to have swindled residents of Reading recently by pretending they were an ophthalmologist and a surgeon from the Wills Eye Hospital, Philadelphia, making examinations and performing so-called operations for cataracts. According to descriptions furnished by his victims, "Dr." Sherman wore a light checked suit and white gold glasses. He weighed about 150 pounds, was about 5 feet 6 inches tall, had a wart or pimple on his left cheek, and drove a light gray automobile with a New York license. "Dr." Harris was described as having a dark complexion, wearing a dark brown mixed suit, weighing about 180 pounds and about 5 feet 5 inches tall.

Society News.—Dr. Theodore O. Elterich, among others, addressed the Pittsburgh Academy of Medicine, February 9, on "Malignant Growths During Childhood."——At the meeting of the Allegheny County Medical Society, Pittsburgh, February 16, Dr. Roy R. Snowden spoke on "Nephrosis: Clinical Aspects and Mechanism of Edema"; Dr. James D. Heard, on "Removal of Foci of Infection: An Appreciation and a Protest," and Dr. John A. Hagemann, on "The Doctor Looks at His Critics."——A symposium on infant feeding was held at the meeting of the Pittsburgh Pediatric Society, February 19, at which the speakers were Drs. Ernest G. Kuhlman, George J. Feldstein and Carl L. Ruder.——Dr. William H. Mayer, Pittsburgh, addressed the Crawford County Medical Society, February 10, on "How the Medical Profession Has Served Humanity in Medical Emergencies."——Dr. Stanley L. Freeman, Wilkes-Barre, addressed the Luzerne County Medical Society, January 6, on appendicitis in infancy and childhood.

Philadelphia

Woman's College Forms Advisory Committee.—The Pennsylvania State Advisory Committee for the Woman's Medical College of Pennsylvania was organized at a luncheon at a meeting, February 13. The formation of this committee will be followed by the organization of similar committees in other states. Arising from these will be a national committee, to be chosen from the state committees, embodying the aspirations of those throughout the country who are interested in education of women in medicine. The Pennsylvania committee was formed to acquaint the people of the state with the immediate objectives of the college and its future ideals as well as of the progress it is making.

Posed as a Physician Seven Years.—Charles Borromeo Smith, who held himself out as a physician for seven years in various cities, was sentenced to three months' imprisonment and fined $100 and costs after pleading guilty, January 25, in the Chester County Court, to a charge of practicing medicine without a license. Smith, who is 31 years old, in 1925, is said to have impersonated a physician of the same name in Uniontown, having obtained a duplicate of the real Dr. Smith's diploma from the University of Maryland by writing authorities there that he had lost his certificate. In a statement to police he said that he had served as a store physician in Chicago, operated a sanatorium in Cleveland, and served as ship surgeon on a steamer plying between New York and the West Indies. He was for a time on the staff of the U. S. Marine Hospital at Ellis Island and even won a commission in the army reserve corps. His last "medical" work was at the Pennhurst state school for the feebleminded near Perkiomenville, Pa., where he had been for only two days when he was arrested.

SOUTH CAROLINA

Bill Introduced.—H. 1483 proposes to require that any poison offered for sale, resembling commonly used foodstuffs, shall be discolored so as to be readily distinguished from any food.

TENNESSEE

Health at Memphis.—Telegraphic reports to the U. S. Department of Commerce from eighty-three cities with a total population of 36 million, for the week ended February 13, indicate that the highest mortality rate (20.8) appeared for Memphis, and the rate for the group of cities as a whole, 11.9. The mortality rate for Memphis for the corresponding week last year was 9.5, and for the group of cities, 14. The annual rate for the eighty-three cities was 12 for the six weeks of 1932, as against a rate of 14.3 for the corresponding period of 1931. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have large Negro populations may tend to increase the death rate.

VIRGINIA

Bill Introduced.—H. TN. 420 proposes to accord liens to hospitals treating persons injured in accidents, on any judgments or settlements obtained by the injured persons by reason of their injuries. H. 186 proposes to create a Board of Barber Examiners and to regulate the practice of barbering.

WEST VIRGINIA

Dr. Crile Gives Lathem Lecture.—Dr. George W. Crile, Cleveland, delivered the second annual Lathem Memorial Lecture of the Medical Review Society of Huntington, January 21, on treatment of exophthalmic goiter. The Lathem Lecture was established in honor of the late Dr. Claude A. Lathem, who died in 1930. The Medical Review Society was formed in 1923 by a group of ten Huntington physicians for informal discussion of medicine and the allied arts and sciences. Members of the Tri-State Medical Society, in session at the time, attended Dr. Crile's lecture.

WISCONSIN

License Revoked.—At a meeting of the Wisconsin State Board of Medical Examiners, January 12, the license of Dr. Robert B. Smiley, Stevens Point, was revoked on a charge of manslaughter.

Evening Clinic for Working Women.—The Wisconsin Medical Women's Society opened a special clinic for working women who cannot afford private medical and dental care, February 8, at Mount Sinai Hospital, Milwaukee, according to newspaper reports. The clinic will be open on Monday evenings as long as there is a need for its service. The patients will receive all kinds of medical treatment except hospital care. The following women physicians of Milwaukee have volunteered their services: Drs. Eleanor Cushing-Lippitt, Elsa Ruth Berger Edelman, Frances Johnson and Gail F. Moxon, and Ruth M. Witcpalek, D.D.S.

County Society Sponsors Graduate Courses.—The educational committee of the Medical Society of Milwaukee County is sponsoring four courses of lectures in Milwaukee for physicians during the winter. A course on diseases of the nervous system and another on diseases of the heart have recently been completed. The third, on surgical diagnosis of the abdomen, began, February 1. The fourth course will be on diagnosis of the chest. These courses are conducted on a group unit plan. After the opening meeting the group splits up into small units, to each of which a local instructor is assigned. Each group then meets at least once a week for three sessions.

GENERAL

New Editor of Mental Hygiene.—Dr. Frankwood E. Williams, New York, editor of *Mental Hygiene* since its establishment in 1917, has retired from that position. He was succeeded by Dr. Clarence M. Hincks, director of the National Committee for Mental Hygiene. Dr. Williams retired from the directorship of the committee in November, 1930, after fourteen years' service (THE JOURNAL, Nov. 29, 1930, p. 1680).

Survey of Mental Disorders.—The National Research Council is sponsoring a survey of the present status of mental disorders in the United States, to be financed by a grant from the Carnegie Foundation. Madison Bentley, Ph.D., of the department of psychology at Cornell University, Ithaca, N. Y., has been granted leave of absence for part of the second semester of the present academic year, to conduct this study. As planned the study will attempt, first, to define the present state of the subject and to estimate the influence of each science now in the field, and, secondly, to discover what the underlying sciences have contributed to understanding and control of mental maladjustment and what the promise is for enlarging knowledge from these sources.

Fellowship Awarded by Foundation.—The Herbert Celler Foundation will award within the next few months a fellowship carrying an annuity of $750 for the year beginning July 1. Each candidate must submit with his application a personal record, a list of his publications, if any, an outline of the work he wishes to pursue and suitable recommendations. This information is to be sent to the secretary, Dr. Benjamin Eliasoph, 941 Park Avenue, New York. The Herbert Celler Foundation was organized to perpetuate the memory of Dr. Herbert L. Celler, who, until his death about four years ago, was associate attending physician at Mount Sinai Hospital. The money was obtained by voluntary contributions from lay and medical friends of Dr. Celler, the income from which was to be awarded to a suitable candidate to pursue further study or research either in the United States or abroad.

The income from the fund is usually about $1,000, but in view of the present financial situation, the annuity has been reduced for the time being.

News of Epidemics.—One hundred and twenty-five cases of smallpox were reported in the public schools of Arnolds Park, Iowa, February 4. The schools were closed in an effort to check the epidemic.——Public meetings were banned in a school district near Hamilton, Ohio, because of smallpox. Twenty-eight cases were reported under quarantine and fourteen patients had been released, January 30. Dr. Clifford J. Baldridge, county health commissioner, advised school authorities to order all students to be vaccinated or be excluded from school.——A recent outbreak of diphtheria at St. Joseph's Orphanage, Cincinnati, has been traced to a carrier among the children at the institution. Twelve children had had diphtheria since November.——An epidemic of influenza was reported, February 11, at the Ohio Soldiers' and Sailors' Orphans' Home at Xenia, where 170 of the 700 children were ill. Schools were closed because of influenza epidemics in Sibley, Iowa, and in Avon, Mount Carroll and Galva, Ill., February 4.——An outbreak of scarlet fever caused the closing of schools in Gnadenhutten, Ohio, February 5; 27 out of 400 pupils had the disease.

Bequests and Donations.—The following bequests and donations have recently been announced:

Church Charities Foundation, Brooklyn, $500,000 by the will of Mrs. Albertine C. Aikman for an addition to the foundation's hospital, to be known as the "Aikman Memorial" for incurable patients.

New York Polyclinic Hospital, $10,000 by the will of the late Elmer A. Darling.

Woman's Hospital, Manhattan, $10,000 by the will of the late Dr. J. Riddle Goffe, Bronxville.

Lutheran Hospital, Brooklyn, $2,500 by the will of the late Mrs. Anna Fulling, Tuckahoe.

Beth Israel Hospital, New York, $4,000 by the will of the late Archie M. Levy.

Chillicothe Hospital, Chillicothe, Ohio, $35,000 for a children's ward, by the will of Mrs. Elinor McKell Mayo, Los Angeles.

Wesley Hospital, Marshfield, Ore., $90,000 by the will of John Sherman Gray. The bequest will be deferred for a time but will ultimately be available after certain obligations involving the income have been fulfilled, it is reported.

Knickerbocker and Manhattan Eye and Ear hospitals, New York, $10,000 each under the will of the late Alfretta H. Gardner.

Presbyterian Hospital, New York, will ultimately receive $1,284,278 as the Wallace Fund, under the will of the late Mrs. Helen M. W. Swan.

The New York Academy of Medicine and the Manhattan Eye, Ear and Throat Hospital, $10,000 each under the will of the late James Brentano Clemens.

Presbyterian Hospital, Philadelphia, $20,000 by the will of Mary E. Joralemon, Ardmore, Pa.

Episcopal Hospital, Philadelphia, $5,000 by the will of the late Lillie M. Madeira.

Coatesville Hospital, Chester County Hospital and Homeopathic Hospital of Chester County, all in Pennsylvania, $2,500 each by the will of the late Frank Parke.

Medical Bills in Congress.—*Change of Status:* S. 894 has been favorably reported to the Senate, without amendment, directing the retirement of acting assistant surgeons of the United States navy at the age of 64 years (Senate Report No. 258). S. 1690 has passed the Senate, providing for the care and treatment of members of the National Guard, Organized Reserve Officers' Training Corps, and citizens in military training camps who are injured or contract disease while engaged in military training. S. 2978 has been favorably reported to the Senate, without amendment, providing for the construction and equipment of a hospital on the Blackfeet Indian Reservation in Montana (Senate Report No. 266). H. R. 7518 has been favorably reported to the House, with an amendment, authorizing the President to confer on the governor of the Panama Canal the right to issue and revoke licenses to practice the healing art under regulations to be issued by the governor and providing a penalty for violations of health regulations (House Report No. 530). *Bills Introduced:* Senator Copeland, New York, has submitted a proposed amendment to the appropriation bill for the Treasury and Post Office Departments, authorizing the importation of brandy and other spirituous liquors for medicinal and other nonbeverage purposes. The proposed amendment has the approval of the Treasury Department. S. 3678, by Senator Davis, Pennsylvania, to convert into a diagnostic center the veterans' hospital numbered 49, at Philadelphia. S. 3748, by Senator Connally, Texas, to amend an act entitled "An Act to recognize the high public service rendered by Major Walter Reed and those associated with him in the discovery of the cause and means of transmission of yellow fever," by including Roger P. Ames among those honored by the act. H. R. 9344, by Representative Patterson, Alabama, conferring on the Student Army Training Corps all the benefits of the World War Veterans' Act. H. R. 9488, by Representative Howard, Nebraska, "to reduce existing tariff duties upon table, household, kitchen, and hospital utensils, and hollow and flat ware."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 23, 1932.

Prenatal "Surgery"

Nature has been said to be a good physician but a bad surgeon. While recovery from disease depends on her efforts, nature fails in such surgical emergencies as gastro-intestinal perforations, severe hemorrhage or the displacements of fractures and dislocations. In a series of lectures on "Malformations of the Human Body Considered from a New Point of View," delivered at the Royal College of Surgeons, Sir Arthur Keith has shown that in embryonic development nature performs operations in many respects comparable with those of the surgeon, but surpassing in delicacy and perfection anything to which he can attain. The greatest of these developmental operations is the enclosure of the entire nervous system. The brain and spinal cord are only a transformed dorsal strip of skin of the embryo. It is remarkable that, although the brain is needed only after birth, it is the first of all bodily structures to be differentiated, appearing even before the heart has become functional and when the embryo is less than one twenty-fifth of an inch long. At this early period the skin of the back is being modified to form nerve plates. In the fourth week the margins of the nerve plates begin to rise, so that first a trough is formed and then a tube. The folded margins of the tube come into contact first in the neck. Edge becomes healed to edge, exactly as they do in a wound brought into apposition; only, the operation is more perfect, for no scar is left. From the neck the process of union spreads forward and backward; in less than a week it has reached the forehead and in less than two weeks the lower region of the trunk. In less than two weeks the whole central nervous system becomes submerged in an orderly manner and the line of submergence is obliterated by a covering of skin. If the operation fails completely, the child is born with the brain and cord exposed. More frequently the failure is partial and spina bifida results. It has been shown experimentally in the fish and the frog that spina bifida can be produced by subjecting the neural plates to injurious conditions—just as union is preventable in a wound.

The formation of the eye entails two operations of developmental surgery. Part of the embryonic tube grows out sideways as a pocket to form the retina. The closed end of this comes against the skin of the head, and the area touched begins to grow inward to form a pocket which abuts against the nerve pocket or outgrowth. Both pockets become shut off—the one from the embryonic skin to form the lens of the eye, the other from the neural tube to form the retina. So perfect is the healing at the point where the lens pocket becomes detached from the skin that no trace is left. Indeed, that part of the skin becomes the cornea. When the first stages of eye formation are completed, one side of the eyeball still remains open. This fissure is closed by a process similar to that which unites the two sides of a wound. If the closure is imperfect, coloboma results. The remarkable discovery has been made that the brain pocket, which grows out to form the retina, is a "master tissue." If it is prevented from coming into contact with the skin, no lens is formed, but if it is detached and embedded beneath any area of skin of the embryo, the overlying skin at once begins to form a pocket and lens. This almost magic power is due to a growth-controlling substance formed within the neural pocket. A similar influence is seen in the formation of galls on plants by insect larvae. Recently Professor Spemann of Freiburg discovered that a certain small area of tissue on the back of the embryo has even more wonderful morphogenic power. If a graft is taken from it and implanted in the side of the embryo, the surrounding tissue

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begins to form nerve plates and a new embryo. The key to some of nature's secret surgical processes, carried out in the routine building of the embryonic body, will be found in morphogenic substances. In the matter of repair, nature is still the master surgeon.

How have the elaborate operations described come into being? In the lowest invertebrates the nervous system is still essentially part of the skin. The elaborate growth and extension of the system in vertebrates became possible only when provision was made for the earlier stages of development being gone through in a position of shelter and nurture, as occurred in the elaboration of intra-uterine life.

Decline of Birth and Death Rates

The Health Section of the League of Nations has published a critical survey of the increase of population in the European countries, Australia, New Zealand and Japan, which constitute one third of the population of the globe. This shows a decline in both the birth and death rates. The fall in the birth rate has varied greatly in different countries. In Germany it is forty times that in Portugal and five times that in France. Japan is the only country in the group studied that has an increase of birth rate. France, which for a long time had the lowest birth rate, has now one higher than England, Austria, Sweden, Norway, Switzerland and Estonia. The decline in the death rate shows less variation. The greatest reductions are in Russia, Spain, Germany, Hungary and Estonia. England, Norway, Sweden, Denmark, Switzerland, Belgium and New Zealand show only a slight reduction to offset the sharp decline in their birth rates. This is because the death rate in these countries had already reached a low level. Since the beginning of the twentieth century the maximum decline in birth rate has been 47 per cent and in death rate 39 per cent, both figures being reached in Germany. Out of twenty-nine countries covered by the survey nine have had a decline of birth rate of more than one third and eight one of from 35 to 23 per cent. The average net increase of population in recent years shows no general diminution in comparison with the years 1900 and 1905. But there is for most countries some diminution. For England, Germany, Norway, Sweden and Belgium the natural increase in recent years is only one fourth of that of twenty-five years ago. For Austria, France and Switzerland there is a diminution of more than 50 per cent. On the other hand, Japan, Spain, Portugal, Ireland and Russia have had since 1928 a greater natural increase than at the beginning of the century. In the year 1928 Europe had an increase of 3 millions, without counting the soviet republics, which appear to have had an increase of more than 2,800,000. Poland, Germany and Italy had an annual natural increase of more than 400,000. Rumania, Spain and England come next with a natural increase of from 200,000 to 300,000. Among the extra-European countries the United States had an increase of 870,000 and Japan of 900,000. The continued fall in the birth and death rates has brought about important changes in the structure of population. The proportion of elderly people is greater and of younger smaller. These changes will in turn bring a rise in the general death rate and a further decline in the birth rate. In particular, the reduced generation born during the war will from 1935 to 1945 have an increasingly depressing effect on the birth rate.

The Danger of High Mountain Climbing

In regard to proposed high climbing in the Himalayas, Sir Leonard Hill, F.R.S., calls attention in the *Times* to careful research work carried out by Dr. Argyll Campbell while Sir Leonard was in charge of the department of applied physiology at the National Institute for Medical Research. Dr. Campbell kept more than 100 mammals of various kinds in an atmosphere equal to that at the top of Mount Everest. He found that not only did no acclimatization take place but there was progressive deterioration, which accompanied degenerative changes in the cells of the heart, liver and kidneys, the result of insufficient oxygen. Few of the animals survived for eight days, and the breathing of oxygen for short periods did not help. Dr. Campbell found that the degenerative changes began at what corresponded to altitudes above 20,000 feet. In this connection it is noteworthy that natives do not take their flocks above 18,000 feet. None of the famous climbers have spent more than ten days at great altitudes, such as 25,000 feet, and a significant lessening of efficiency has been reported: those who tried to reach the top of Everest lost their lives. Sir Leonard Hill points out that want of sufficient oxygen lessens the power of judgment. The power of any individual climber to resist this want cannot be tested by a short exposure to lessened atmospheric pressure. The advice of Sir Leonard is that climbers should aim at one or two of their party, who prove to be the most resistant, reaching the top as quickly as possible after leaving the base camp placed below 20,000 feet, before serious degeneration of the heart has taken place.

Decrease in the Incidence of Syphilis

The annual report of the British Social Hygiene Council (formerly the National Council for Combating Venereal Diseases) gives a survey of the venereal problem in this country since the inception of the government scheme fifteen years ago by which local authorities were required to provide the free diagnosis and treatment of venereal disease. The returns from the treatment centers, which deal with the great majority of cases, show that in the fifteen years new infections with syphilis have fallen by 50 per cent, a result attained by no other country except Sweden, where the teaching of social hygiene is compulsory. The evidence from the centers is supported by the statistics from the army and the air force. In the army the incidence of syphilis per 10,000 has fallen from 9.8 in 1921 to 2.1 in 1929 and in the air force from 4.1 to 0.8. In the army, regular instruction is given to all officers and men on the medical aspect of the problem. Further evidence of the decline of syphilis is the fall of the rate per thousand births of deaths of infants certified as due to syphilis from 1.34 in 1912 to 0.64 in 1929. Thus the bringing of the infected under treatment at the free centers provided by the state, as a means of preventing the spread of syphilis, has proved sound. But the council believes that a certain proportion of syphilitic women and children are escaping the operation of the scheme. The prevention of congenital syphilis by the detection and treatment of every case in prospective mothers appears to be well worth doing.

The efforts to cope with gonorrhea have been less successful. The number of cases treated at the centers shows a slight increase, but this is held to be due to a greater use of the centers rather than to an increase of infections. But the low ratio of cases of gonorrhea treated at the centers to cases of syphilis in women (1.18 to 1) suggests that a large proportion of infected women remain untreated. Far too many patients reach the centers after being months or even years under the care of physicians who have failed to recognize the disease. Among them are many suffering from arthritis, which should always stimulate an investigation into the question of gonorrhea. An important part of the reduction of syphilis is due to the action of arsphenamine in quickly making the patient noninfectious. It is said that the incidence of gonorrhea has not been affected because there is no such specific. But the council holds that if women came for immediate treatment more freely the incidence of gonorrhea would decline. It insists that public education is essential for the effective carrying out of the voluntary system of free treatment. This is proved by the fact that an increase of patients has followed lectures on venereal disease and the showing of films. The small proportion of women with gonorrhea who seek treatment shows the great need for educational measures with regard to this disease.

PARIS

(From Our Regular Correspondent)

Jan. 13, 1932.

The Hematopoietic Potency of Carotene

Carotene has been the subject, in France, of important researches; among others, those of Maurice Javillier and of Mlle. Enrique, who have shown that carotene is capable of reestablishing the growth of rats subjected to a diet defective in vitamin A. Nevertheless, it is certain that carotene and vitamin A are different substances that present many distinctly different reactions. But the research of T. Moore and of S. Captain, on rats and pullets, has established that carotene ingested by these animals is transformed in their liver into vitamin A, of which a reserve supply is accumulated. Prof. Léon Binet and Mr. V. Strumza have recently discovered an interesting property of carotene that (although their experiments thus far have been exclusively on laboratory animals) appears to indicate that this substance performs an important rôle in therapeutics. It exerts a remarkable influence on hematopoiesis. Several lots of dogs were made anemic by venesection. In one lot, the restoration of the erythrocytes and of the hemoglobin was allowed to take place spontaneously, while, every day, the progress of the restoration was checked by an examination of the blood. In another lot, carotene was administered to the anemic animals, and it was found that in the latter the hemoglobin was restored more rapidly to normal than in the controls. At the same time the number of erythrocytes increased in the same proportion. To be sure, these experiments had to do with only one form of anemia, and it remains to be determined in man what the effects of this treatment would be in pernicious anemia and in anemia due to hypochlorhydria. One must not, however, overlook the fact that in animals the reserve depot of vitamin A is found in the liver. Mouriquand has already demonstrated that a deficiency of vitamin A accompanies a marked anemia. The question may therefore be raised, though possibly hazardous, as to whether the secret of the effects of the ingestion of calf's liver in anemia does not lie in the fact that the liver is the depository for vitamin A.

Measurement of Quantity of Radium Rays Employed in Treatment

A valuable device invented by Dr. Lucien Mallet has been introduced for the measurement of the quantity of gamma rays of radium used in a radium therapeutic treatment and presented to the Academy of Sciences. It consists of two independent parts: a small ionization chamber, which is introduced into the cavity or the tissues to be treated, and an electrometer capable of measuring the minutest electrotonic charges. After the operation, the ionization chamber is attached to the electrometer, which indicates accurately the loss of load represented by the quantity of gamma rays dispensed.

Medicolegal Value of Dust Found in Watches

Dr. Severin Sicard of Marseilles, to whom medicine is already indebted for the discovery of a sure test of death (the injection of a solution of fluorescein), has just published an article on the medicolegal value of the microscopic examination of the dust found within watch cases. Watch cases always contain more or less dust, which finds entrance through the various openings in the case—through the spaces about the hinges, through the opening for the winding stem, and around the margin of the watch crystal. Dust penetrates by aspiration when the watch, carried at body temperature in the vest pocket, has first driven out a part of the air that it contains and that the heat has expanded and then, having returned to a normal temperature, draws in the air and the dust that it contains. Mr. Sicard confirmed these statements by a few simple experiments. He covered a watch with flour and placed it near a heated surface. Later he inspected the watch and found no trace of flour within it; but, on performing the experiment a little differently, and, before opening the watch, leaving it for a time exposed to the outside temperature, he always found flour within it. An examination of the dust found in watches may supply useful information as to the trade or profession and the usual occupations of the subject when there are found certain substances in quantities exceeding by far those found in ordinary dust, or when the substances are absolutely characteristic in themselves. Flour is found in the watches of bakers, coal dust in the watches of miners and of stokers, baked clay in the watches of brickmakers, iron and copper on metal workers, bits of vegetable peelings on workmen handling such products in a dry state, particles of hair on hair-dressers, fragments of raw wool on wool washers, and plaster and cement on masons. The same substances, if a careful search is made, will be found in the handles of pocket-knives and in the tubes of small keys. Watches worn on the wrist by women or kept in their handbags contain rice powder, and one finds resin dust in the watches of violinists. Such information may be of great aid to the police in their researches. A watch found on a person accused of having stolen it was certainly stolen if it is found to contain flour or coal dust, whereas the accused person has never been either a baker or a coal miner. Dr. Severin Sicard had already previously made similar observations in studying microscopically the dust that becomes mixed with the ear wax in the exterior auditory meatus.

BERLIN

(From Our Regular Correspondent)

Jan. 11, 1932.

Possible Injury to Germ Cells by Roentgen Rays

A recent letter touched on the question of possible injury to germ cells by roentgen rays (THE JOURNAL, Nov. 21, 1931, p. 1552). On account of its great importance, this problem has occupied of late, in Germany, many persons engaged in that line of work. For that reason, the Berlin Gesellschaft für Geburtshilfe und Gynäkologie devoted recently a session to a discussion on temporary "castration" by roentgen rays, which was participated in by many prominent gynecologists, researchers on heredity and radiologic experts. The opening paper was presented by Privatdozent von Schubert, on the staff of the Frauenklinik der Charité, who called attention to the difficulties of the method. Temporary castration is unsuccessful in 5 per cent of the cases; on the other hand, supposedly temporary castration will, in a like percentage of cases, prove permanent, which is a serious matter for young women and may give rise to criminal or civil suits. The uncertainty of the method is due chiefly to the two facts that one does not know exactly what roentgen dosage it is necessary to employ and that women of a given age do not all react in the same manner to a given dosage. Furthermore, there are other modes of treatment, so that in the Frauenklinik der Charité this method is not employed.

The physical and technical problems were discussed by the Berlin radiologist Professor Friedrich and the Erlangen gynecologist Professor Wintz, who contends that the strength of the roentgen dosage can be determined within 5 to 10 per cent. Professor Martius of Göttingen and Prof. Eugen Fischer of Berlin-Dahlem discussed the questions pertaining to possible injury of the germ cells by irradiation of the ovaries. That the modifications in the germ cells brought about by roentgen rays may give rise to mutation has been shown by the experiments on flies (Drosophila). Conclusions with regard to man must of course be drawn with great caution; but it is certain that we do not know as yet what dosage applied to man may be considered harmless. While it is true that the conditions in the ovary of Drosophila are different from those obtaining in

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man, and also that mature ova are more sensitive to roentgen rays than immature ova, even the latter may be killed and a permanent castration be brought about. Professor Nürnberger, gynecologist in Halle, does not regard the danger as very great, and emphasized that no evidence is available to show that roentgen mutations occur in man as the result of roentgen irradiations. It is clear from this discussion that, in any event, there is no assurance that an injury of the germ cell by roentgen rays may not occur, and the indications for the application of this method must hence be drawn with great reserve.

New University Clinics in Freiburg

In spite of the economic depression, an endeavor is being made to complete buildings that have been begun, if the money for them has been appropriated and is available. What retrenchments have become necessary in the field of science was explained in previous letters. A short time ago, the newly erected medical and surgical clinics of the University of Freiburg, Baden, were dedicated. Their construction and hygienic arrangements are of the most modern type, so that it is doubtful whether they are excelled by any similar institutions in Germany or elsewhere. The two new university clinics have about 700 sick-beds. It is planned to erect later in a similar style a new ear, nose and throat clinic, which will complete the so-called Klinikenring. The funds for the two buildings erected (about $4,000,000) were furnished in part (two fifths) by the city of Freiburg and in part by the government of Baden (three fifths). It is estimated that the buildings to be erected will require the expenditure of nearly $2,000,000 more.

The Three Hundred and Fiftieth Anniversary of the University of Würzburg

On Jan. 2, 1932, the University of Würzburg celebrated its three hundred and fiftieth anniversary. The university was established in 1402 but was closed in 1413 and was not reopened until Jan. 2, 1582. In contrast with most other schools of higher learning that were the outgrowth of the Reformation, this university was designed by the bishop-prince as a stronghold of catholicism. The university retained its ecclesiastical character until the end of the eighteenth century. When, however, in 1803, it came under the control of Bavaria, it took on a more liberal character. Of the more eminent members of the faculty of medicine in modern times may be mentioned Virchow, Rokitansky and Roentgen. The faculty of medicine achieved, however, a period of greatness about fifty years ago, when Kolliker, C. Gerhardt, E. von Bergmann, Szanzoni and Michel formed a brilliant galaxy. A portion of the university is still housed in the old building that dates back to 1582-1591, a beautiful Renaissance structure with a church whose magnificent tower serves as an observatory. For the clinics, new buildings have been erected in comparatively recent times; but the old Julius Hospital, well known to many German and foreign students since their university days, is still in use.

Research on Vitamin B

The year 1931 stands out above all others in the history of biochemical research. In the course of a few months, in one of the most difficult fields, the chemistry of vitamins, remarkable advances were made. Three important vitamins have been obtained in a crystallized and absolutely pure state, vitamin A having been secured by Professors Euler and Karrer; vitamin C by the young Norwegian Rygh, and vitamin D by Prof. Adolf Windaus of Göttingen, working in collaboration with his pupils. Following these discoveries, the latest event is the exhibition, in a pure state, of that portion of vitamin B that is known as B_1, the factor that is effective against beriberi.

Intensive research has been made on this vitamin since 1926, when Jansen and Donath in the Netherlands succeeded in isolating from rice bran a crystallized substance active against a beriberi-like disease of pigeons. The Netherlanders regarded the substance as a nitrogen-containing base—apparently an alkoloid. Several attempts at verification yielded fluctuating results with reference to the activity of the crystals, which awakened some doubt as to their purity. Further doubt was injected into the matter by the fact that these crystals could not be isolated from yeast, known to be rich in vitamin B. The Göttingen chemist Prof. Adolf Windaus, and Prof. Fritz Laquer of the I. G. Farbenindustrie, in collaboration with other scientists, have improved so markedly the method of Jansen and Donath that they have now obtained from yeast a preparation of the vitamin that can be regarded as uniform and pure. Jansen's assumption that the newly discovered substance is a nitrogen base was confirmed. It contains, however—strange to say—also sulphur. Its potency is about three times greater than that of the best preparation heretofore known. In experiments on pigeons it was found that about 0.0024 mg. suffices for the prevention of the severe convulsions that are due to the lack of vitamin B_1.

VIENNA

(From Our Regular Correspondent)

Jan. 8, 1932.

Regulations Concerning Use of the Term "Specialist"

During the deliberations of the Vienna chamber of physicians, last year, Dr. Sonnenfeld presented a communication in which he explained the present regulations concerning the assumption by physicians in Austria of the title of "specialist." At present there are no legal regulations bearing on the right to assume and use the title of specialist in the republic of Austria. Only with regard to the admission of physicians to the *krankenkassen* having free choice of physician has any regulation of the specialist problem been attempted. As affecting the contracts between the organization of the medical profession and the *krankenkassen*, the following regulation obtains: "Only such physicians who, following a special course of training, confine their practice to a special branch of medicine are entitled, in principle, to announce themselves as specialists. Such physicians are recognized by the economic organization of physicians as specialists and are announced to the *krankenkassen* expressly as specialists for a certain branch of medicine. They are not permitted to serve, at the same time, as general practitioners." Every specialist must be a member of the Verband der Fachärzte (league of specialists) in Vienna if he wishes to practice in Vienna. In the provinces outside Vienna the title "specialist" is approved, by the chamber of physicians having jurisdiction, only after the applicant has furnished evidence of his special training. The special training required has been standardized by the Verband der Fachärzte in the following manner: A specialist can practice in only one of the following fields: surgery, dermatology, gynecology (including obstetrics), internal medicine, respiratory organs, neurology and psychiatry, ophthalmology, orthopedics, otorhinolaryngology, pediatrics, physical therapy, roentgenology, urology and medical laboratories, or a total of fourteen specialties. That holds for Vienna; in the provinces the three specialties orthopedics, urology and medical laboratories drop out. In case of need, the chamber of physicians has the right to combine two or more specialties (internal medicine and pediatrics, and respiratory organs, or ophthalmology and otorhinolaryngology, or surgery with gynecology and radiology). Every specialist in Vienna or in the provinces must first request admission to the narrower group and furnish proof that he has fulfilled the conditions for admission as specialist, which, for the nonoperative branches, are at least four years of training in a clinic or hospital service dealing with his specialty, and, for the operative specialties, five years of training and experience in such an institution. The applicant must also furnish proof that, for at

least two years of the four to five year period, he served as assistant to the department head and was thus compelled to work more or less independently. The applicant is not recognized by the Verband der Fachärzte until the group of specialists concerned has admitted him; he can then enter into contracts with the health insurance societies *(krankenkassen)*. But in case a physician does not seek service with the *krankenkassen*, he can select any specialty he desires, specialize in that branch of medicine, and announce himself as a specialist in that branch; and, if he desires, he can practice also general medicine, which the members of the specialist groups are strictly prohibited from doing, as has already been mentioned. But he cannot be admitted to membership in the Verband der Fachärzte. It should be noted, however, that the general public has become so used to regard and patronize only the members of the Verband der Fachärzte as specialists that the other specialists receive little consideration. The only specialist title that is protected by law in Austria is that of *zahnarzt* (physician-dentist), since the study of dentistry is regulated by law and only doctors of general medicine who devote themselves exclusively to dentistry may call themselves *zahnarzt*, other persons ("dentisten," technicians, and others) not being permitted to refer to themselves as *zahnärzte*. In Vienna there are something over 4,000 registered physicians, for a population of 1,810,000. Of that number, 800 are hospital physicians, 1,220 specialists, 650 physician-dentists *(zahnärzte)*, and the remainder (about 1,400) general practitioners, 290 of whom are women. Among the specialists and physician-dentists there are 110 women. In Austria, outside Vienna, there are about 2,600 registered physicians, with about 600 specialists and physician-dentists.

Poisoning from Illuminating Gas

The use of gas for the lighting of streets in the larger towns of Europe goes back about 100 years, having been employed in Vienna for the first time in 1827. It is only during the past fifty years that public buildings and apartments have used gas, to any great extent, for illuminating purposes. With the beginning of this century gas began to be widely used for heating and cooking purposes, and now it is used quite generally even in small households. As a result, the opportunities for poisoning have increased. In 1914 there were 152 such cases of poisoning in Vienna, with 12 deaths; in 1930 the number of cases of poisoning rose to 1,360, with 446 deaths. A frequent cause of such accidents is the lack of knowledge of the use of gas-burning apparatus. In recent years, more than 40 per cent of all attempted and successful suicides in Vienna were accomplished with illuminating gas. The poisonous effect of the gas is due chiefly to the carbon monoxide it contains, the percentage of which varies considerably, dependent on the raw material used and the mode of production. The Austrian gas works produce illuminating gas with from 18 to 37 per cent of carbon monoxide; in Vienna the gas contains 16 per cent of carbon monoxide. There are no statistics of poisoning due to illuminating gas in Austria in earlier decades, so that it must have been a rare occurrence. About five years ago Dr. Damianos, who publishes this report in the *Mitteilungen des Oesterreichischen Volksgesundheitsamtes*, collected the first accurate data, with the collaboration of the police department in Vienna and the municipal gas works. It is interesting to note that in 1883 on three occasions municipal aid was given in connection with fatal gas poisoning. In 1892 there were 8 deaths and 18 first-aid treatments, whereas in 1930 in Vienna there were 380 suicides, 66 fatal accidents and 914 nonfatal accidents and attempts at suicide—an enormous increase in forty-seven years. The statistics collected by Dr. Damianos present the following picture: Cases of poisoning by illuminating gas increased slowly from 1883 to 1907; then from 1908 to 1914 there was a more rapid increase, and after the war the figures jumped up rapidly: 1890, 11 cases; 1900, 53; 1910, 149; and in 1928, 430 fatal and 1,013 nonfatal cases. Since 1928 the figures have not changed much. Furthermore, the statistics show that the number of suicides with gas exceeded by far the number of accidents (if one considers records of the last few years): 397-33, 398-77 and 380-66. It will be seen that about 40 per cent of all cases of poisoning with gas are immediately fatal and of the nonfatal cases more than 60 per cent were severe cases necessitating hospitalization of the patients. From 1890 to 1899, only 1 per cent of all suicides in Vienna were accomplished by means of gas; in 1928, however, the percentage was 40; in 1929, 41; in 1930, 45. If one compares the number of suicides and accidents by gas in Vienna with the number so occurring in the remainder of Austria, one gets the following figures: In 1913 there were 211,825 gas consumers in Vienna as against 35,975 in Austria; in 1928, however, the ratio was 463,220 to 69,775; in 1929 it was 468,033 to 72,398. In 1928 there were 397 suicides in Vienna and 15 in Austria, and a total of 1,443 gas accidents in Vienna as against 50 in the remainder of Austria. In 1929 there were 398 suicides in Vienna and 29 in the provinces, a total of 1,441 gas accidents as against 84 in the rest of Austria. It appears that the number of gas accidents has now been stabilized and that before long one may count on a decline.

Death of Prof. Benjamin Lipschütz

The death of Prof. Benjamin Lipschütz, the well known investigator and dermatologist, at the age of 53, has been announced. Professor Lipschütz devoted his attention chiefly to the biologic problems of dermatology and venerology. Various types of disease that he studied in detail and described bear his name; for example, ulcus vulvae acutum Lipschütz, erythema migrans Lipschütz, epithelioma contagiosum. His most important field, however, comprised the so-called inclusion diseases. In his "Manual of the Protozoa," he described the Chlamydozoa theory, molluscum contagiosum, fowl plague and the strongyloplasmata. Furthermore, he studied and published important articles on the cell structure of malignant growths. In 1915 he was made privatdozent, and, only a short time before his early death, he received the title of university professor, an honor that he, in his modesty, had never hoped to attain.

BELGIUM

(From Our Regular Correspondent)

Jan. 5, 1932.

Labor Contract Affecting the Natives of the Congo

A new order has gone into effect in the Belgian Congo region, some features of which, pertaining to the hygiene of labor, deserve to be noted. The care of the health of workmen, porters and paddlers, employed in the commercial, industrial and agricultural enterprises, is placed under the control of a government physician, designated by the governor of the province as inspector of health of workmen, and of accepted physicians commissioned by him as assistant inspectors with only local authority. The inspection of the health of workmen has the special mission of supervising the regulations pertaining to the health of employees and of prescribing such measures as are needed to safeguard the lives and health of workmen employed in enterprises that are of a markedly dangerous and unhealthful character. It functions in collaboration with the inspection service of industry and commerce, communicates to the latter the sanitary measures that it prescribes, and gives it all the necessary technical instruction. If the measures prescribed by the inspection of health appear to the employer to be ineffective or burdensome, he may appeal to the governor of the province, whose decision, and the basis therefor, are forwarded to the complainant and to the author of the measure that was the object of the inquiry. No one may recruit or employ a native who has not been shown to

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be physically adapted to the work in question, nor may employees be required to do work for which they have not been shown to be fitted. The examination as to physical aptitude for a given type of work is made by a government physician or an approved physician.

Every employer and labor agent must provide gratuitously whatever medical care is needed by employees and recruits, and, in order properly to meet this obligation: 1. The employer must, irrespective of the number of employees, place at the disposal of the head of the camp a first-aid kit containing the drugs and dressings in current use, in a perfect state of preservation, ready for immediate use and amply sufficient for the purpose intended, and he must have a portable medicine chest if he employs porters or paddlers. 2. When the number of workmen exceeds 100 men, employed in the same place or distributed within a radius of 15 kilometers, he must employ a native man nurse, and additional men nurses at the rate of one nurse for each 200 employees; he must employ a white nurse if the number of workmen reaches 500 men, or one white nurse for each five native nurses employed if the workmen are scattered; he must entrust the medical service to a physician if the number of workmen reaches 1,000. 3. In every camp or settlement comprising more than 100 workmen, he must provide a special building to be used as an infirmary or hospital, if there is no hospital within a radius of 25 kilometers of the enterprise; the infirmary must have a number of beds equal to 5 per cent of the number of workmen, and there must be medical assistants provided, who, if they are not under the direction of a graduate physician, are placed in charge of government physicians. 4. The infirmary or hospital must keep a daily record of the number of patients, the nature of the disease, the date of its onset and the date of the recovery, and if more than 100 workmen are employed, an abstract of the record must be sent each month to the medical inspector of health.

Belgian Society for the Prevention of Blindness

The first session of the Association belge de prophylaxie de la cécité, the object of which is to combat the various causes of blindness, was held recently. The program outlined by the new society is identical with that of the Association internationale de prophylaxie de la cécité, an organization, with headquarters in Paris, which centralizes the efforts of the various chapters that exist in nearly all parts of the country and that has attained considerable development in foreign countries, notably the United States and England. The new society plans to work in collaboration with the existing societies that deal with the care of the eyes as a secondary feature of their program (Croix-Rouge de Belgique, Croix-Rouge du Congo, Ligue contre le péril vénérien, Ligue contre la tuberculose, Oeuvre nationale de l'enfance, Ligue d'hygiène mentale, Ecole centrale du service social). It will give its whole attention to the crusade against occupational eye accidents and will keep in touch not only with government but also with private industrial undertakings, and with organizations engaged in the prevention of occupational accidents. Finally, it will act on its own account by the diffusion of tracts and advice on health matters and by the organization of lectures. Professor Van Duyse, member of the Academy of Medicine and professor of the University of Ghent, is the organizer of this new society, which numbers among the members of its organizing committee many high officials and many leading ophthalmologists.

Reorganization of Institutes of Physical Education

Experience has shown the necessity of modifying the work and studies of the higher institutes of physical education. Likewise, a higher institute of physical education has been organized as a department of the faculty of medicine at each of the two government universities, located at Ghent and at Liége, respectively. The institute confers the degrees of licentiate of physical education, agrégé of physical education, and doctor of physical education.

Life Insurance for the Medical Profession

At the congress of the Fédération médicale belge, Dr. Peeters took up the subject of life insurance and pensions for the medical profession. Three matters were brought to the attention of his hearers: (1) the significance of life insurance in general, (2) mutual life insurance as a system, and (3) the appointment of a managing directorship. As regards mutual life insurance, experience has shown the incompetence of medical men in financial matters, for which reason mutual life insurance is contraindicated for physicians. There is a natural incompatibility between "business management" and the "medical temperament." The appointment of a managing directorship consists in entrusting to a competent and responsible organization what, owing to medical incompetence and incompatibility, medical men have never been able to compass. A managing body composed of members of the medical profession should be replaced by a managing directorship that has proved its ability in matters of life insurance. Following the presentation of this report, the congress decided (1) to appoint a committee that would unite, under the egis of the Fédération médicale belge, all the scattered mutual aid societies, in order that they may attain a maximum of efficiency, and (2) to get in touch as soon as possible with a life insurance company, or with a firm of actuaries, or with whatever organization appears proper for the realization of the purpose, with a view to organizing an insurance and pension system for physicians.

ITALY

(From Our Regular Correspondent)

Dec. 31, 1931.

National Congress of Surgery

The Società italiana di chirurgia held its thirty-eighth national congress in Bari, under the chairmanship of Professor Righetti. The official speakers on the topic "Associated Syndromes of the Right Half of the Abdomen" were Prof. Nicola Leotta of Bari and Dr. Giulio Vita of Palermo. Leotta divided the associated syndromes of the right half of the abdomen into four groups: (1) right abdominal syndrome; (2) right abdominal syndrome with cholecystitis; (3) right abdominal syndrome with gastric ulcer; (4) right abdominal syndrome with cholecystitis and gastric or duodenal ulcer. The right abdominal syndrome comprises changes in the appendix, and the adjacent intestine and lesions of the omentum and the perivisceral structures. One must assume the constant existence of an appendicitis, active or inactive. The foregoing changes are the result of a chronic peritoneal infective process.

The peritoneal lesions are associated with a simple chronic peritonitis of digestive origin, in which appendicitis plays a big part. The complex symptomatology results from three principal factors; namely, the peritoneal inflammatory factor, the mechanical factor (retraction of the meso-appendix, adhesions) and the nervous factor. There are digestive disturbances, spontaneous pains, chronic intoxication, and symptoms due to the lesions of the internal organs. The right abdominal syndrome with cholecystitis differs from the preceding owing to the coexistence of cholecystitis. This is manifested by classic biliary colic or by less intense attacks of pain. The right abdominal syndrome with ulcer is associated with the presence of a gastric or duodenal ulcer. These are of infectious origin, due to ascending infection.

Dr. Giulio Vita, who discussed the radiologic part of the topic, described the technic employed in the study of the associated syndromes of the right half of the abdomen. In the stomach are observed changes in form due to retraction of the lesser omentum, often accompanied by atonia and constipation.

The antrum of the pylorus may undergo traction, from which marked shifting to the right results. The duodenum may present retropositions of the bulb, deformations of the first and second portions, and/or spasmodic or paretic conditions of the ampulla of Vater. For the diagnosis of adhesions of the colon the speaker suggests the adoption of his method of studying the behavior and the changes of form that the colon undergoes before and after the ingestion of a drastic purgative.

Pozzi of Milan spoke on the syndrome of chronic appendicitis in tuberculous mesenteric glands. Surgical intervention in these cases alone will clarify the diagnosis and appendicectomy will prevent secondary infections of the glands.

Dr. Guido pointed out the value of the Meltzer-Lyon test in the associated syndromes of the right half of the abdomen; it represents a valuable aid in the diagnosis of lesions of the biliary passages.

ACUTE AND CHRONIC PANCREATITIS

The second topic, "Acute and Chronic Pancreatitis," was treated in collaboration with the Società di medicina interna. Prof. Antonio Gasbarrini of Bologna pointed out that the inflammatory processes that affect the pancreas cause reactions not only in the parenchymal tissue but also in the supporting tissue; to these may be added, as characteristic factors, cellular necrosis, hemorrhages and steatonecrosis. The general clinical symptoms of these lesions furnish few factors that aid directly in the diagnosis. Diagnostic importance attaches, however, to the pain, the discovery of tumors at the site of the pancreas, and functional disorders. The digestive tests, particularly the amount of fecal fats, according to Zoia, acquire importance for the diagnosis of chronic pancreatitis, while in the acute (necrotic) forms an increase in the diastase content of the blood and the urine appears to be especially significant.

The study of the lipase in the blood serum does not furnish a secure basis of judgment, and the same is true, as regards chronic pancreatitis, of the amount of fecal ferments, of which only trypsin apparently furnishes presumptive criteria worthy of consideration. Acute pancreatitis includes a necrotic form, a suppurative form and a gangrenous form. The primary factor in the characteristic succession of pathologic symptoms appears to lie in the cellular necrosis, which results in the liberation of a ferment that is a potent stimulus to the production of trypsinogen. The edema, the hemorrhages, the peritoneal reactions, and the fatal toxic factors are secondary to the local and general action of the trypsin. Chronic pancreatitis, more frequently than acute, accompanies diseases of the surrounding organs, especially disorders of the biliary passages and of the duodenum. The characteristic lesions consist chiefly of hyperplasia and sclerosis of the supporting tissues, and atrophy of the glandular parenchyma. The insular tissue is often spared but is sometimes hypertrophic. The clinical symptoms consist in phenomena of compression of such nearby organs as the common bile duct and the duodenum, and, often, in the presence of a palpable tumor. There is sometimes little pain. The prognosis is in direct relation to the possibility of direct surgical intervention for the removal of the original focus of infection.

The surgical part of the topic was presented by Professor Tusini of the University of Genoa. The etiologic factors of acute necrosis of the pancreas, he stated, are all capable of producing within the gland activations of the pancreatic ferment. The disease begins suddenly with grave shock, acute epigastric pain (especially on the left side), and persistent vomiting of bile. The temperature is normal or nearly so; there are intense cyanosis and dyspnea without demonstrable pulmonary and cardiac changes. There is evident relationship between the state of collapse and the nature of the pulse. Operative intervention is indicated, but it is necessary to select the opportune moment (more or less early). Chronic pancreatitis is rather frequent, especially with biliary complications.

The symptomatology furnishes no pathognomonic signs, and hence the clinical diagnosis is extremely difficult. It is important to proceed systematically with an accurate exploration of the pancreas, and it may be desirable to resort to biopsy. The treatment varies. If there is icterus, treatment consists in biliary drainage, which relieves the retention of the bile and often cures, of itself, the pancreatitis. Biliary drainage may be applied either by drawing off the bile or by diverting it within by means of various anastomosis procedures, according to the needs. Cholecystostomy often heals, with a minimum risk, the inflammatory lesions of the pancreas, making it possible to survey the evolution of rebellious forms and to apply, in the second stage, if necessary, an appropriate treatment. Depending on associated lesions caused directly by the pancreatitis in adjacent organs, corresponding operations may be introduced, for the most part on the stomach and on the duodenum.

Dr. Calzavara of Treviso emphasized the significance of acute hyperglycemia for the early diagnosis of acute necrosis of the pancreas. He said that researches on hyperglycemia should be made systematically in cases of acute abdominal lesions in which pancreatitis is suspected.

Drs. Biolato and Villata of Turin discussed the behavior of Bacterium coli cultivated from the pancreas, in relation to experimental pancreatitis. The researches of these authors have shown that the pancreas has extraordinary resistance to infection, which may be brought about through the blood stream or by the canalicular route.

Dr. Zaffagnini of Parma experimentally produced acute pancreatitis by the introduction of foreign bodies into Wirsung's canal. On introducing the foreign body externally into the intestinal lumen, he observed the genesis of a simple chronic pancreatitis, such as can be brought about by the simple ligation of the canal. When, however, the foreign body was introduced by the duodenal route, after a moderate edema and intralobular and perilobular infiltration there was restitutio ad integrum.

Before adjourning, the congress selected Rome as the next meeting place.

TURKEY

(From Our Regular Correspondent)

Ankara, Jan. 25, 1932.

Repeal of Compulsory Governmental Service for Physicians

In view of the scarcity of physicians in the remote eastern provinces, a law was passed in 1923 according to which a two years' compulsory governmental service was required of the graduates of the medical school. Women physicians were exempt, chiefly because of unsatisfactory living conditions and other professional hardships in the remote provinces. The enforcement of this law has almost accomplished its purpose but seems also to have resulted in fewer applications for admittance to the medical school by candidates who pay their own expenses. So, partly owing to the fact that the majority of vacancies in the eastern provinces are filled now, a bill has recently been introduced into the national assembly according to which this law will be repealed. Only physicians graduating hereafter will benefit by this repeal; those at present working on their two years' term will be required to terminate it. But physicians who have studied at government expense and who have lived all or part of the required time at the government's medical students' home will continue to serve their term in governmental service. The license of a physician found guilty of shunning his obligations in this respect will be withheld for five years, and he will be required to bear the whole cost of his education. Students who have studied at government expense and lived at the medical students' home and who give up the study of medicine, or who for reasons other than physical

unfitness have been advised to leave the medical school or home for good, will also be required to pay their expenses.

Alcoholic Beverages Invade the Rural Communities

Alcoholic beverages are forbidden all true believers of Islam, and until recently alcoholism has not been a problem in Turkey. The establishment of ale houses or bars within a Mohammedan community, or in the vicinity of a mosque, was prohibited. Wine was used on the occasion of the celebration of a wedding or of a circumcision, but without such an excuse it was used by a Mohammedan only clandestinely in the home, for if it became known, all household members would be ostracized. Three decades ago uniformed officers were rarely seen using alcoholic beverages openly; they were not permitted to enter places where these were served. But customs have changed with regard to their use, especially since the World War, and now in the large cities alcoholic beverages have entered almost every home. During the war of independence, prohibition was enforced throughout Anatolia; but prohibition was abandoned four years later, partly because of the difficulties in enforcing the law and partly because a monopoly constitutes a source of income; so a government monopoly was instituted instead. Though the monopoly made alcoholic beverages more expensive, they are now in demand even in remote provinces and, according to press reports, the first train bound for Malatia on the opening of the new railroad line to Malatia in 1931 carried ten carloads of them. At the last national medical congress Dr. Fahreddin Kerim, associate professor of mental diseases at the medical school and secretary of the Green Crescent, the Turkish antialcoholic society, reported that alcoholic beverages had lately found their way into the rural communities. When crops fail and peasants work in town they become acquainted with alcoholic beverages and introduce them in the villages. The alcoholic drink generally preferred in Turkey is "raki," which is made from fresh grapes. It is white and distilled, and is flavored with anise; its alcohol content varies from 40 to 60 per cent. The second most popular drink is beer. Turkish women formerly never touched anything containing even the slightest trace of alcohol, but since their emancipation after the World War they have given up their repugnance and today the society woman does not despise a glass of wine at a party. It is mostly during the summer that youths get acquainted with alcoholic beverages by taking a glass of beer in a beer garden. In view of the ever increasing automobile accidents due to intoxicated drivers, and the increase in homicides and divorce traceable to the use of alcoholic beverages, the antialcoholic society has proposed a law to close saloons, thus confining the use of alcoholic beverages to the home.

The Prevention of Cerebrospinal Meningitis

Cerebrospinal meningitis is rare in Turkey, but in the winter of 1928-1929 it was epidemic in Tarsus, near Adana. The disease seemed to have disappeared but during the autumn of 1930 it reappeared in the same locality and during the winter of 1930-1931 an epidemic occurred in Adana. A thorough search was made for meningococcus carriers, who were at once isolated, and diluted iodine or iodine-glycerin was applied to the nasopharynx until further examinations were negative. The absence of roads made laboratory tests and mass examination in rural communities difficult. Therefore it was decided to make general the application of antiseptics. But the application of irritating medicaments was not practical and did not give satisfactory results. As cases occurred in 1931 with the same severity in localities where such measures were taken the year before, another method was decided on. A solution of acriflavine hydrochloride, 1:250, was used, two or three drops in each nostril morning and night. It was easy to apply this method in schools and in the homes. In communities where it was possible to use this preventive measure generally, the disease has disappeared.

Marriages

TOSON OLCOTT SUMMERS, Surg., Lieut. Commander, U. S. Navy, to Miss Cynthia Mary Peacock of Derby, England, February 16.

HENRY LEVI DAVIS, Huntington Park, Calif., to Miss Frances Leon Gibson of Independence, Kan., January 29.

ELVIN L. SEDERLIN, Laramie, Wyo., to Miss Edythe Christine Cutter at Holmesville, Ohio, January 28.

ARTHUR C. DEAN, Hot Springs, S. D., to Miss Grace J. Hansen of Huron, at Omaha, recently.

LEONARD BEAVER ULSH, Philadelphia, to Miss Eleanor A. G. Grenover, recently.

Deaths

Albert Edward Flagstad ✠ Minneapolis; University of Minnesota Medical School, Minneapolis, 1921; member of the Clinical Orthopedic Society and fellow of the American College of Surgeons; assistant instructor in orthopedics at his alma mater; on the staffs of the Gillette State Hospital for Crippled Children, St. Luke's Hospital, Bethesda Hospital, Midway Hospital and the Children's Hospital, St. Paul, and the Fairview Hospital, Minneapolis; on the visiting staff of St. Joseph's Hospital, St. Paul; aged 40; died, January 26, of lobar pneumonia.

William Henry Cantle ✠ Mamaroneck, N. Y.; Cornell University Medical College, New York, 1901; member of the Associated Anesthetists of the United States and Canada; past president of the Westchester County Medical Society; served during the World War; formerly on the staffs of the United Hospital, Port Chester, and the New Rochelle (N. Y.) Hospital; aged 56; died, January 30.

Henry I. Raymond ✠ Colonel, U. S. Army, retired, Berkeley, Calif.; Bellevue Hospital Medical College, New York, 1880; entered the army as an assistant surgeon in 1881 and was promoted through the various grades to that of colonel in 1915; was retired by the President in 1919, being 62 years of age; veteran of the Spanish-American War; aged 74; died, January 30, in the Letterman General Hospital, San Francisco.

Jesse Sumner Bragg, Manchester, N. H.; Medical School of Maine, Portland, 1905; member of the New Hampshire Medical Society, Maine Medical Association, New England Dermatological Society and the Radiological Society of North America; on the staff of the Hôpital Notre-Dame de Lourdes; aged 54; was killed, January 1, when his shotgun accidentally exploded.

Victor Henry de Somoskeoy, West Chester, Pa.; Detroit College of Medicine, 1905; served during the World War; public health director of Chester County; formerly health officer of Morgan County, Ill., and deputy state health officer of the tenth sanitary district of Maryland; aged 54; died, January 12, in the Chester County Hospital, of pneumonia.

Greyson Curtis Gardner, La Junta, Colo.; Indiana University School of Medicine, Indianapolis, 1925; member of the Colorado State Medical Society; served during the World War; on the staffs of the Atchison, Topeka and Santa Fe Railroad Hospital and the Mennonite Hospital and Sanitarium; aged 36; died, January 18, of tuberculosis.

Solon Rodney Towne, Omaha; Dartmouth Medical School, Hanover, N. H., 1875; member of the Nebraska State Medical Association; emeritus professor of hygiene, University of Nebraska College of Medicine; formerly on the staff of the Douglas County Hospital; aged 85; died, January 28, of bronchopneumonia.

Edward James Mahoney, Bedford, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1928; on the staffs of the Bedford (Ohio) Municipal Hospital and the Huron Road Hospital, Cleveland; aged 29; died, January 22, in the Springfield Lake Sanatorium, East Akron, of pulmonary tuberculosis.

John Abraham Freeborn ✠ Fergus Falls, Minn.; Rush Medical College, Chicago, 1889; Bellevue Hospital Medical College, New York, 1892; served during the World War; on the staff of the George B. Wright Memorial Hospital; aged 67; died, January 25, in Rochester, of carcinoma of the pancreas.

Louis Grey Stirling, Baton Rouge, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1894; member

of the Louisiana State Medical Society; formerly member of the city council; on the staff of Our Lady of the Lake Sanitarium; aged 69; died, Dec. 19, 1931, of heart disease.

Marvin Lamar Parler, Wedgefield, S. C.; Medical College of the State of South Carolina, Charleston, 1900; member of the South Carolina Medical Association; on the staff of the Tuomey Hospital, Sumter; aged 52; was instantly killed, January 15, when his gun was accidentally discharged.

George Rosario Cusson ✠ Berlin, N. H.; University of Vermont College of Medicine, Burlington, 1924; member of the New Hampshire Medical Society; president and formerly secretary of the Coos County Medical Society; aged 33; died, January 4, in Burlington, Vt., of chronic nephritis.

Frederick Murray Doyle, Chicago; Jenner Medical College, Chicago, 1903; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; member of the Illinois State Medical Society; aged 51; died, Dec. 8, 1931, of coronary embolism.

Alfred Pellar Webb, Atmore, Ala.; Medical College of Alabama, Mobile, 1896; member of the Medical Association of the State of Alabama; formerly chairman of the board of education; on the staff of the Atmore General Hospital; aged 58; died, January 11, of cerebral hemorrhage.

Louis Livingston Seaman ✠ Bronxville, N. Y.; Jefferson Medical College of Philadelphia, 1876; Medical Department of the University of the City of New York, 1877; veteran of the Spanish-American and World wars; aged 80; died, January 31, in the Lawrence Hospital.

Arthur Ramsey Williamson, Pueblo, Colo.; Hahnemann Medical College and Hospital, Chicago, 1912; member of the Colorado State Medical Society; aged 50; died, January 7, in St. Mary Hospital, of streptococcic septicemia, streptococcic meningitis and otitis media.

Charles Holt McDonell, Winona, Minn.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1906; member of the Minnesota State Medical Association; on the staff of the Winona General Hospital; aged 55; died, January 12, of heart disease.

Joseph Grant Killgore, Vermilion, Ill.; Kentucky School of Medicine, Louisville, 1888; member of the Illinois State Medical Society; aged 65; died, Dec. 27, 1931, in a hospital at Paris, of injuries received in an automobile accident.

Charles C. Mandeville, Galion, Ohio; Starling Medical College, Columbus, 1893; served during the Spanish-American and World wars; aged 65; died, January 17, in the Good Samaritan Hospital, of carcinoma of the parotid gland.

Arthur B. Smith, Cleveland; New York Homeopathic Medical College and Hospital, 1897; aged 59; died, January 20, in St. John's Hospital, of injuries received when the automobile in which he was driving was struck by a train.

Elmer Clarence Byram, Okmulgee, Okla.; National University of Arts and Sciences, St. Louis, 1912; member of the Oklahoma State Medical Association; aged 49; died, January 23, in the City Hospital, of coronary thrombosis.

James C. May, York, Pa.; Jefferson Medical College of Philadelphia, 1881; member of the Medical Society of the State of Pennsylvania; for six years member of the school board; aged 74; died, January 19, of arteriosclerosis.

Edward N. Chastain ✠ Butler, Mo.; Missouri Medical College, St. Louis, 1881; secretary and past president of the Bates County Medical Society; aged 75; died, January 5, of chronic myocarditis and aortic regurgitation.

Ida M. Kahn, Nanchang, China; University of Michigan Medical School, Ann Arbor, 1896; superintendent of the Women's and Children's Hospital; aged 58; died, Nov. 9, 1931, in a sanatorium at Shanghai.

William Warren Murphy, Sierra Madre, Calif.; Missouri Medical College, St. Louis, 1876; Bellevue Hospital Medical College, New York, 1884; aged 85; died, Nov. 21, 1931, of cerebral embolism and thrombosis.

Eugene Harold Brown ✠ Pueblo, Colo.; Northwestern University Medical School, Chicago, 1911; served during the World War; on the staff of St. Mary's Hospital; aged 43; died, January 24, of pneumonia.

John West Benton, Ogdensburg, N. Y.; University of Pennsylvania School of Medicine, Philadelphia, 1886; for many years health officer of Ogdensburg; aged 67; died, January 25, of carcinoma of the stomach.

Howard Winslow Gibbs, Scranton, Pa.; Baltimore Medical College, 1913; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 44; died, January 30, of carcinoma.

John Thomas Johnson, Taft, Calif.; Jefferson Medical College of Philadelphia, 1909; aged 52; died, Nov. 8, 1931, in the Cottage Hospital, of chronic interstitial nephritis and hypertension.

Charles W. Geel, Berlin, N. Y.; Albany Medical College, 1885; member of the Medical Society of the State of New York; aged 82; died, January 2, of acute dilatation of the heart.

Arch Sylvester Chapman ✠ Fort Smith, Ark.; University of Nashville (Tenn.) Medical Department, 1909; aged 45; was found dead, Dec. 22, 1931, of a self-inflicted bullet wound.

Henry Egerton Day, Kingston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1902; aged 54; was found dead in his garage, Dec. 14, 1931, of heart disease.

Martin V. Tyndall, Springfield, Mo.; Barnes Medical College, St. Louis, 1896; also a druggist; aged 67; died, January 21, of chronic nephritis and cerebral hemorrhage.

Edwin Russell Tuttle, Miami, Fla.; Hahnemann Medical College and Hospital, Chicago, 1888; aged 68; died, January 5, of cerebral hemorrhage, hypertension and myocarditis.

Joseph Dutra, Santa Maria, Calif.; Boston University School of Medicine, 1895; aged 72; died, Nov. 5, 1931, of cerebral hemorrhage and cardiovascular renal disease.

James M. McDowell, La Grange, Tenn.; University of Tennessee Medical Department, Nashville, 1880; aged 74; died, Dec. 3, 1931, of heart disease and nephritis.

William Anthony Hershiser, Oakland, Calif.; Cooper Medical College, San Francisco, 1891; aged 71; died, Nov. 2, 1931, in Turlock, of cerebral hemorrhage.

Frederick Harlan Hadley, San Francisco; Cooper Medical College, San Francisco, 1896; aged 61; died, Nov. 24, 1931, of cerebral hemorrhage and arteriosclerosis.

Benjamin W. D. Hill, Dawson, Texas; University of Tennessee Medical Department, Nashville, 1885; aged 68; died, January 1, in a sanatorium at Waco.

Andrew Johnson Waynick, Clarksville, Tenn.; University of Tennessee Medical Department, Nashville, 1885; aged 70; died, Nov. 23, 1931, of mitral stenosis.

Leander A. Dascombe ✠ Skowhegan, Maine; Bellevue Hospital Medical College, New York, 1877; aged 78; died, Dec. 23, 1931, of cerebral hemorrhage.

Letitia L. Frantz, Lancaster, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1884; aged 73; died, Dec. 18, 1931, of cerebral hemorrhage.

E. Davis Allen, Cortland, N. Y.; Eclectic Medical College of the City of New York, 1880; aged 76; died, January 21, of a self-inflicted bullet wound.

Walter Harvey Sullivan, Sausalito, Calif.; Cooper Medical College, San Francisco, 1883; aged 70; died, January 14, of an injury received in a fall.

Charles Chester Sperry, Marengo, Ill.; Chicago Medical College, 1874; aged 80; died, January 29, of chronic myocarditis and chronic nephritis.

Frank Edgar Dolson, Philadelphia; Jefferson Medical College of Philadelphia, 1901; aged 53; died, January 21, of carcinoma of the stomach.

Eliphalet N. Wright, Olney, Okla.; Albany (N. Y.) Medical College, 1884; aged 73; died, January 9, in Dr. Moorman's Sanatoria, Oklahoma City.

Thomas Ezra Rhodes, St. Louis; Barnes Medical College, St. Louis, 1910; aged 57; died, Dec. 28, 1931, in the Central Hospital, of empyema.

Joseph French Duncan, Etowah, Tenn.; University of Louisville (Ky.) School of Medicine, 1882; aged 72; died, Dec. 23, 1931, of septicemia.

Truman Huff Holmes, Bremerton, Wash.; Medical College of Ohio, Cincinnati, 1889; aged 65; died, January 7, of tumor of the brain.

Dudley Cureton Frise, Minneapolis; University of Illinois College of Medicine, Chicago, 1915; aged 44; died, January 10, of heart disease.

Preston A. Edwards ✠ Nardin, Okla. (licensed, Oklahoma, under the Act of 1908); aged 71; died, January 27, of cerebral hemorrhage.

Sherrod W. Dutton, McCracken, Kan. (licensed, Kansas, 1901); aged 90; died, January 3, in Ness City, of arteriosclerosis.

William T. Hinds, Arab, Ala.; Medical College of Alabama, Mobile, 1890; aged 68; died, Dec. 21, 1931, of heart disease.

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Correspondence

FLOWERS IN THE SICKROOM

To the Editor:—In THE JOURNAL, Dec. 5, 1931, page 1731, Dr. Stein asked why flowers are removed from the sickroom at night. In your answer you say: "The statement of one hospital superintendent that carbon dioxide is liberated is apparently not correct. Living plants absorb carbon dioxide and give off oxygen."

True enough, but this absorption of carbon dioxide stops in the dark, and cell respiration continues. Respiration is going on continually, in light and in darkness, and carbon dioxide is given off. It isn't true that the processes of giving off carbon dioxide and oxygen are reversed. Carbon dioxide is given off day and night, the rate being but little higher during the day or in the light than it is in darkness or at night. It varies somewhat more with change in temperature, increasing up to 40 C. Weight for weight, plants give off about the same amount of carbon dioxide as animals do. No patient in an average sized room could notice the effect of an average sized bouquet of flowers as far as the carbon dioxide is concerned. And the amount of oxygen given off during the day is also negligible as far as the patient is concerned.

A. P. SY, Buffalo.
Professor of Chemistry, University of Buffalo.

[NOTE.—Irrespective of whether the reaction is that of yielding oxygen or of yielding carbon dioxide, the amounts given off are surely not appreciable so far as any change in the oxygen-carbon dioxide ratio of a well ventilated hospital room is concerned.—ED.]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

CHLORINE LEAKS IN CHLORINATION OF SWIMMING POOLS

To the Editor:—In connection with the chlorination of a swimming pool there sometimes occur leaks in the apparatus. The nature of the escaping gas makes it almost impossible for the attendant to do the necessary work to locate the leaks and, besides, constitutes a menace to him and to others. Can you advise me as to what means may be taken to safeguard the life and health of the attendant and at the same time permit him to do the required work in the presence of escaping chlorine gas? If there is no satisfactory measure other than the use of a gas mask, can you inform me where such a mask may be obtained and advise me concerning its probable length of serviceable life?

SHATTUCK W. HARTWELL, M.D., Muskegon, Mich.

ANSWER.—Any sustained and substantial leak of chlorine in connection with the chlorination of swimming pool waters indicates defective apparatus. Modern chlorinating machinery, when properly operated, prevents any leaks in harmful concentrations. The wearing of a gas mask around a swimming pool is poor psychology, if worn in view of the bathers. Prejudice against chlorination is thus created, and patronage is likely to diminish. For this reason the point of first attack in control should be the apparatus itself. If, for some practical reason, leaks cannot be eliminated by tightening the apparatus, a gas mask is necessary. Chlorine is an immediate irritant to the respiratory tract when the concentration is no higher than 15 parts per million parts of air. Prolonged exposure to an atmosphere containing 2 parts of chlorine will eventuate in some damage. This amount is lower than that giving rise to any odor of chlorine.

Suitable gas masks may be procured from the Mine Safety Appliances Company, Braddock, Thomas and Meade streets, Pittsburgh. In addition, extensive information, including many other sources of gas masks, may be obtained from the National Safety Council, 20 North Wacker Drive, Chicago.

With reasonable care, the serviceable length of life of an occasionally used mask may be one year, although replacement of certain parts may be required.

DANGER OF SYPHILIS TO ATTENDING PHYSICIAN

To the Editor:—A member of my class in the school of medicine, while attending an autopsy on a congenital syphilitic fetus, Oct. 10, 1931, had a small drop of the bloody water splashed into his eye. The incident was not noticed by the instructor, and the student thought little of it at the time. However, about two hours later he began to worry and washed his eye with a dilute solution of a germicide. He went to the director of the clinic for advice. He was given an injection of 0.5 Gm. of neoarsphenamine late that same afternoon, or about six hours after the accident. Two days later he was given an injection of 0.4 Gm. of arsphenamine, and one week following this, another injection of 0.4 Gm. of arsphenamine. At no time did a lesion of any sort develop on the conjunctiva. The Wassermann and Kahn tests were done, December 18, or about ten weeks following the accident, and both were negative. What is the possibility that infection actually occurred? Was the treatment given sufficient to abort the possible infection? Should this student have the Wassermann or Kahn tests repeated at intervals? Please omit name.

M.D., Missouri.

ANSWER.—Three possibilities must be considered:

1. The organisms were dead in the fetus or so weakened by the water or the injected germicidal solution that they could not infect.
2. The infection took place but was overcome by the treatment.
3. The treatment was sufficient to delay development of the infection but not enough to cure it.

It is to be hoped that the fact agrees with either the first or the second of these possibilities; but it must be granted that the third is possible, and therefore the case should be watched carefully for the rest of the year. A clinical examination with particular attention to the eye, the mouth and the anogenital region, and serologic tests should be made once a month. If nothing develops in one year, we believe that the danger is past. The first possibility is probably the true one.

IRRADIATION IN CARCINOMA OF BREAST

To the Editor:—In scirrhous carcinoma of the breast, is it advisable to use preoperative and postoperative radiation, as recommended in other types of carcinoma of the breast? Please omit name.

M.D., California.

ANSWER.—The scirrhous type is by far the most common form of breast cancer. Except in hopelessly inoperable stages of the lesion, i. e., ulceration of the skin with infection, the same treatment routine is applicable, a combination of surgery and irradiation. Preoperative irradiation, originally advised on the basis that a preliminary lymphatic block is produced, is no longer advised. Postoperative irradiation, beginning about ten days after operation, is necessary and is undoubtedly responsible for the relatively high percentage of present-day cures. It is important to remember that the scirrhous form, though less malignant than the medullary, is still a malignant tumor and that when axillary lymphatics are involved in this type of the disease (scirrhous) the incidence of early recurrence is about 80 per cent.

TREATMENT OF EXFOLIATIVE DERMATITIS

To the Editor:—I should like to know the treatment of dermatitis exfoliativa and the rationale of giving splenic extract, if there is any. Please omit name.

M.D., Arizona.

ANSWER.—The first indication is rest in bed, which also affords protection from chilling. Colloid baths may be given, one or more a day according to the response on the part of the patient; the water should be kept at an even temperature (about blood temperature or a little below) and the patient protected from drafts by blankets over the tub. If necessary, an ice bag should be used on the head. When the patient emerges from the bath, the skin should be dabbed partly dry and an ointment (10 per cent boric acid in petrolatum or ointment of rose water) applied immediately. The bath is made by boiling three cupfuls of oatmeal to a mush and putting it in a gauze bag and then into the tubful of warm water, in which a cupful of sodium bicarbonate has already been dissolved. The bag of oatmeal should be squeezed gently and the water stirred with it.

Engman uses the powder bath, keeping the patient naked in a bed full of talcum powder, with plenty of powder dusted on the skin. For a day or so this may be uncomfortable, but then the patient comes to like it and improves.

For nonarsphenamine cases, the exception nowadays, quinine in large doses is recommended. Acetylsalicylic acid or pilocarpine may be useful. For the much commoner cases due to overdosage with arsphenamine or its modifications, sodium thiosulphate intravenously is the chief remedy, the drug being carefully prepared for intravenous use dissolved in a small amount of sterile distilled water. From 0.1 to 0.3 Gm. once a day is given at first; the dose is gradually increased to 1 Gm. daily and is then given once every other day. Sometimes this

treatment disagrees and must be discontinued. Roentgen rays in fractional doses, one fourth of an erythema dose once a week, are highly recommended by Andrews, care being taken that not too large a part of the surface of the body is treated on any one day. The blood count, particularly the white cell count, should be carefully watched. If a leukopenia appears, it may be due to an overdose of rays. Unfiltered rays are used.

The rationale of the injection of splenic extract is not well understood nor has the product been standardized. The spleen belongs to the reticulo-endothelial system, and certain extracts made from it seem to have a marked effect in supplying something necessary to the prevention of infection in splenectomized animals and human beings. It also seems at times to be effectual in the treatment of anemias and other general disorders. In skin disease, such as eczema and urticaria, it has been used most effectually in the various forms of sensitization. Exfoliative dermatitis belongs to this group, and it might be expected to have a beneficial effect. Whether this action is that of a foreign protein or a hormone, or whether it is due to the nuclein so plentiful in the spleen is not established.

POSSIBLE TABES OR CEREBROSPINAL SYPHILIS

To the Editor:—About two months ago, I saw a young man at his home, evidently in severe pain. His hands were pressed tightly together on his abdomen just to the left of the end of the sternum. He complained of severe nonradiating pain in this area. While I stood there, questioning him, the attack suddenly disappeared, leaving absolutely no tenderness. When he could speak more freely, he told me that this had been the second attack he had had of this nature. The seizures came on suddenly, gradually growing in intensity until the pain was almost unbearable, nonradiating and localized to a small area in the upper portion of the abdomen just to the left of the line of the sternal border and just below the lower ribs. After the pain disappears, there is no tenderness left or any local symptoms. I found that the bowels were constipated and for the last two months the patient had been eating irregularly, his meals being mostly cold beer, sandwiches and salted peanuts. He was 33 years of age, well built and had always been perfectly well. He gave an absolutely negative past history of stomach disorders and was physically normal on examination. I made a diagnosis of acute gastritis, put him on a suitable balanced die, emptied his bowels and gave him a digestive mixture. The following week he was all right, felt fine and had no further attacks. I again examined the heart and abdomen, and could find nothing. I happened to think of Osler's dictum, "Know syphilis and you will know disease," so I asked the patient whether he had ever had a chancre. He stated that he had, about a year before. He had gone to a doctor who had put some powder on the chancre and had told the patient that the disease would never bother him in his blood. Aside from a somewhat sluggish reaction of the pupils to light, I could not find any external evidence of syphilis, and he stated that there had not been any symptoms. I did not do a lumbar puncture but took a Wassermann test, which showed a reaction of 4 plus for both antigens. Do you think that these attacks of pain that he had could have been tabetic? Also, please inform me of the approved system of treatment which I should use here for the syphilitic infection, especially as to how long the treatment should continue and how long this patient should be kept under observation after the Wassermann reaction is made negative. I do not wish to do a puncture on this man unless you think it necessary, as he is sensitive to pain and faints every time a needle is used under his skin. HAROLD D. SEHL, M.D., Clarkes Mills, N. Y.

ANSWER.—In the absence of more definite signs, such as loss of deep reflexes, incoordination and a positive Romberg sign, a positive diagnosis of tabes dorsalis is not justified. It is possible, however, that the attacks are of the nature of gastric crises resulting from syphilis of the nervous system and that the disease may evolve more typically. Since no antisyphilitic treatment has been administered, active courses should be instituted, starting with compounds of mercury and possibly of bismuth, arsphenamine being given later. A lumbar puncture may be postponed until these preliminary treatments have been administered but should then be done in order to establish or rule out involvement of the central nervous system and furnish a guide to subsequent treatment. Under this heading will have to be considered some form of fever therapy and the use of tryparsamide as well as further active antisyphilitic remedies. The puncture should not be delayed merely because the Wassermann reaction of the blood has not become negative but should be done shortly after the completion of the first course of antisyphilitic remedies.

RABIES VACCINES AND PASTEUR TREATMENT

To the Editor:—Please give me the comparative values of rabies vaccine and the Pasteur treatment in the prevention of rabies. This city is called on to do considerable work along this line and the difference in cost between the standard rabies vaccine and the Pasteur treatment is considerable. P. R. OUTLAW, M.D., El Paso, Texas.

ANSWER.—So far as the available evidence goes, the newer rabies vaccines, including those made of killed virus, are about as efficient as the old Pasteur treatment, which utilized a living attenuated virus.

USE OF COCAINE FOR LOCAL ANESTHESIA IN CYSTOSCOPY

To the Editor:—The free use of cocaine solutions by ear, nose and throat specialists has caused me to wonder whether urologists do not exaggerate the dangers of this drug as a urethral injection. The remark of Keyes that "cystoscopy as usually performed is a scandalously painful operation" seems borne out by the obvious apprehension with which male patients view the procedure. I should greatly appreciate an authoritative reply to the following questions: Is cocaine generally condemned by the best authorities as a local anesthetic for the urethra, or is its use permissible in suitable amounts and with caution? At the Mayo Clinic I observed that a 1 per cent solution of cocaine hydrochloride was used for cystoscopies, apparently as a routine. Do you think that any danger attends this? What volume of a 1 per cent solution of cocaine hydrochloride could one inject into a man's urethra and bladder with reasonable safety preliminary to passing sounds, cystoscopes and similar instruments? Would subacute or chronic urethritis materially increase the danger of toxic absorption of such an injection? Is butyn, isocaine or any other cocaine substitute (excluding procaine hydrochloride, which seems of little value) efficacious and safe for urethral injection? Please omit name. M.D., Utah.

ANSWER.—The best urologic authorities are divided as to the risk incurred in the injection of cocaine into the male urethra. Keyes and Randall warn against its use, while Walthers and the staff of the Mayo Clinic report that they have used it for years without untoward effect.

Thirty cubic centimeters of a 1 per cent solution may be used with reasonable safety preliminary to the passage of sounds or cystoscopes, provided the solution is made up fresh for each case. This can readily be done by dissolving two 2¼ grain (0.146 Gm.) tablets in 30 cc. of water. There are some who believe that some of the toxic properties in cocaine solutions are the result of a fungus growth which appears in most stock solutions in a very short time. Care should be taken to inject the solution slowly and to avoid the exertion of undue hydrostatic pressure, as rupture into the small blood vessels occurs easily.

Subacute or chronic urethritis has never been noted to increase the danger of toxic absorption.

Butyn, isocaine and other cocaine substitutes are not as efficacious as cocaine, according to clinical experience, and it is doubtful whether they are any safer for urethral injections.

Following instrumentation, either immediate or delayed, cocaine solution should not be injected into the urethra, as traumatized surfaces induce rapid toxic absorption.

REACTION TO SENSITIZATION

To the Editor:—A farmer, aged 33, consulted me regarding spells of dizziness and nausea which come on only when he does work in his barn. He has been troubled for about four weeks, never before. He states that he feels perfectly well in any other place, has a good appetite and has never been ill in his life that he can recall. He can do his work without any difficulty whatever, with the exception of indoor work in his barn. He says that in a few minutes after entering his barn, perhaps only to put a harness on a team, he begins to feel dizzy and sick and is obliged to get out into the fresh air, where in a short time he feels all right again. So far as he knows, there are no chemicals or fumes of any kind in the barn other than those from the animals and their droppings. I have examined him carefully several times and cannot find anything abnormal. The urine, the blood and the special senses are normal, and the mentality also apparently is normal. I suggested that he try some oil of cloves in petrolatum to be smeared in the nostrils just before entering the barn. He tells me that this prevents the dizziness for a while, till the aroma of the cloves is dissipated.

A. H. CAMPBELL, M.D., Rocanville, Sask.

ANSWER.—The spells of vertigo and nausea, which occur only when the patient is working in the barn, may be explained in either of two ways: 1. They may be an evidence of functional disorder; the odor of the barn and its contents may cause the patient to feel nauseated and dizzy. This theory, however, is lessened in value by the fact that the duration of symptoms is only four weeks, whereas in all probability such contact has existed from childhood. 2. The symptoms may be due to an allergic manifestation; the odor or inhalation of animal dander from the barn contents may cause a temporary disorder of the brain. Just what the nature of this condition is can only be surmised, as no pathologic reports exist. However, it is known that allergy in general is characterized by one or both of two conditions: spasm of smooth muscle or increased capillary permeability with resultant localized edema. The latter condition would be compatible with symptoms such as are noted here and could come and go rapidly just as the ordinary hive, which is a localized area of edema, may come and go quickly. Whether the condition is allergic or not will depend on further information, such as (1) the presence of some other allergic condition in the patient; for example, asthma, hay fever, urticaria or migraine; (2) a history of some allergic condition in the family; (3) the presence of blood

eosinophilia, or (4) positive skin reactions, although these probably would not be obtained. An important clinical test would be to have the patient come in contact with the various contents of the barn, such as horses or cattle, separately, inside and outside the barn. As for treatment, in addition to the measures described the patient might cover his nostrils and mouth with a wet piece of cloth or gauze so that inhalation of the obnoxious odor or dander would be difficult.

UNUSUAL PURPURIC LESIONS OF EXTREMITIES

To the Editor:—A woman, aged 60, with an irrelevant history, six weeks ago felt a severe pain, like the sting of a bee, on the left ankle, anterior to the external malleolus. This was followed at once by an intense itching, not relieved for several minutes, and this in turn was followed by a severe burning sensation. Shortly, there appeared a hemorrhagic area measuring about 1 by 2 inches. For days, at intervals of a few hours and lasting for several minutes, the cycle of sting and itching and burning was repeated. Now the skin over the area has become thickened and brownish, almost wartlike, and the same cycle as before mentioned is repeated several times a day. Lately other hemorrhagic areas, of various sizes, have appeared below the knee, with slight itching and burning, to disappear promptly while others appear. Kindly indicate the name of the malady and suggest treatment. Please omit name.

M.D., Indiana.

ANSWER.—The greatest obstacle to a helpful answer to this question is the difficulty that is always encountered in visualizing a skin lesion from any written description. The best that can be done is to suggest some possibilities.

The picture could be explained as due to one of the purpura group, the local manifestation of which may vary considerably. A form of simple purpura is observed in those past middle life, especially in those with varicose veins or other circulatory disturbances in the lower extremities, which has been designated as purpura senilis. In this condition purpuric spots appear usually just above the ankle and and on the lower leg. The spots may remain for long periods, and leave pigmented areas. There is a possibility also of a purpura of more serious significance, and the patient should be examined for evidence of systemic disease.

Urticaria also may show a hemorrhagic tendency. Erythema nodosum must also be considered but appears unlikely from the description, as the lesions are red, later becoming darker, but are not hemorrhagic. A form of erythema multiforme, erythema perstans, may show nodules and be itchy, but this is also not hemorrhagic.

Embolic phenomena are a possibility that must be ruled out. The treatment is that of the causative pathologic process.

TREATMENT OF FREQUENT URINATION AND BURNING SENSATION

To the Editor:—A woman, aged 39, has had burning and frequency of urination beginning 5 years ago. She has one child, aged 12, who was delivered instrumentally. A cystocele was repaired three years ago, after which her bladder symptoms disappeared for three months. She had a suprapubic drainage and 1: 1,500 silver nitrate irrigations one year ago, following which her symptoms disappeared for a few months and gradually returned. At this operation it was found that she had a small inflamed bladder. She has had many cystoscopic and urine examinations, which have always been negative. She is a druggist's wife and has tried every urinary antiseptic known without benefit. Bladder irrigations with boric acid, and mild silver protein or mercurochrome-220 soluble in the bladder give some temporary relief. She insists there is something wrong in the urethra, but examinations reveal nothing. The former cystocele is well repaired. There is a small rectocele. What do you advise in the line of further treatment?

CHESTER A. CLARK, M.D., Morley, Mich.

ANSWER.—In cases of contracted bladder that resist treatment, as apparently this one has, one would think of the possibility of submucous infiltration of the bladder or what is often called elusive ulcer. Tuberculosis might be thought of, but this should have been picked up in the examination of the patient. If an ulcer is the cause of the symptoms, the treatment would necessarily depend on the location of the ulcer.

EXCESS HAIR ON GIRL'S BODY

To the Editor:—A girl, aged 5 years, of normal height, weight and sexual development, presents a heavy growth of fine hair on the forearms, back and legs. This condition has been getting more marked for the past six months. The past medical history is negative except for chronic tonsillitis. Is this a sign of glandular dysfunction? What treatment do you advise?

LEWIS E. ETTER, M.D., Warrendale, Pa.

ANSWER.—This child probably has some endocrine disturbance. The two glands most liable to be at fault in such cases are the pineal and the suprarenal cortex. A large majority of patients having a teratoma of the pineal also experience precocious puberty. This is accompanied by some increase in the amount of body hair, particularly the pubic and axillary hair, and, of course, by precocious development and function of the genital apparatus. Tumors of the suprarenal cortex more frequently give rise to, or at least are accompanied by, an increase in the amount of hair on the body and face. When these occur in young children they are also accompanied by a precocious growth of the body and genitalia.

One can only suggest that this child be kept under observation, having in mind particularly the possibility of disturbance in the pineal or the suprarenal cortex. No treatment can be suggested at this time. Frequently, cases of abnormal development of hair clear up without treatment.

SHOES FOR CLUBFOOT

To the Editor:—Can you refer me to a manufacturer of shoes for use in convalescence from infantile congenital clubfeet; i. e., shoes with the front part abducted instead of adducted in the common way of children's shoes? I. Sabel, 1015 Chestnut Street, Philadelphia, makes such shoes but refuses to furnish a single clubfoot shoe with a normal mate without a premium of $1.50 over the charge of $7 for two clubfoot shoes. This seems to me not to meet the need of patients with clubfoot, as more than half of them are one-sided cases.

M.D., Michigan.

ANSWER.—The firm mentioned is used by many orthopedic surgeons. It does seem a little strange to be charged $7 for two clubfoot shoes and $1.50 extra for mismating. When a firm mismates two pairs of shoes, it returns the two others to the factory for remating and, therefore, must make this charge. It is stated on good authority that 57 per cent of cases are unilateral.

INTOXICATION FROM LACQUER AND DUCO

To the Editor:—Have there been cases reported of toxic effects from Duco or other lacquers? A patient who suffers with weakness, nervousness and loss of weight feels that his condition is due to inhaling such materials.

M.D., Illinois.

ANSWER.—The term "Duco" applies only to certain products of the Du Pont Company. Duco consists largely of the acetates of amyl, butyl and ethyl, diluted with denatured alcohol, toluene, butyl alcohol and amyl alcohol. From the point of view of its effects on health it probably does not differ greatly from the pyroxylin lacquers that have been used for many years. Cases of poisoning with such lacquers have been reported in various periodicals. Most of the constituents of lacquers are irritants to the respiratory tract. It is conceivable that the symptoms to which the patient refers may be due to toxic action of some of the ingredients that have been listed. However, it is important to determine the exact content of the lacquer used, whether or not the condition originated during or shortly after exposure, and other factors that are of importance in relationship to industrial disturbances.

PREVENTION OF TRANSMISSION OF RINGWORM

To the Editor:—We have, at our plant, the question of disinfecting rubber boots so as to render them safe for reissue. I desire to safeguard especially against the transmission of tinea infections from one person to another. What is the best method of accomplishing this purpose?

E. C. MCCULLOCH, M.D., Staten Island, N. Y.

ANSWER.—The solution used for preventing the spread of ringworm in schools, solution of chlorinated soda, diluted to contain 1 per cent of sodium hypochlorite, may be successful, or a 5 per cent solution of thymol in alcohol. The boots should be rinsed afterward; in case of the hypochlorite treatment, the rinsing should be with water; in case of thymol, which irritates some skins, the excess should be removed from the boots by rinsing with alcohol.

AREAS OF GIANT RAGWEED GROWTH

To the Editor:—Will you please advise me as to the specific localities in the United States, especially in the Eastern section, that are free from giant ragweed? I have heard that Montauk Point, Long Island, N. Y. is. Can you confirm this?

EMILY C. LACY, Annapolis, Md.

ANSWER.—It is altogether likely that giant ragweed is absent in the vicinity of Montauk Point, as this species is not usually found in sandy soil. This plant thrives best in the rich, alluvial soil of river bottom land. It is not found at all on the Pacific Coast and grows sparingly in the Mountain states. Its northern range does not extend as far as that of short ragweed (Ambrosia elatior). It is fairly common in southwestern Ontario but is not found at Toronto. Although common at Buffalo, only stray specimens are found east of the Connecticut River and there is none along the coast, from Charleston, S. C., to Miami.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examinations will be held in nineteen cities of the United States and Canada, March 26. The general, oral and clinical examination will be held in New Orleans, May 10. Sec., Dr. Paul Titus, 1015 Highland Building, Pittsburgh.

ARIZONA: Phoenix, April 5-6. Sec., Dr. B. M. Berger, 12 N. Central Ave., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles and San Francisco, March 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, April 6-9. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Homeopathic.* New Haven, March 8. Sec., Dr. Edwin C. M. Hall, 82 Grand Avenue, New Haven. *Regular.* Hartford, March 8-9. *Endorsement.* March 22. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

IDAHO: Boise, April 5. Comm. of Law Enforcement, Hon. Emmitt Pfost, Boise.

ILLINOIS: Chicago, April 12-14. Supt., Mr. Paul B. Johnson, Springfield.

MAINE: Portland, March 8-9. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland.

MASSACHUSETTS: Boston, March 8-10. Sec., Dr. Stephen Rushmore, 144 State House, Boston.

MINNESOTA: *Basic Science.* Minneapolis, April 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

MONTANA: Helena, April 5. Sec., Dr. S. A. Cooney, Power Block, Helena.

NEW HAMPSHIRE: Concord, March 10-11. Sec., Dr. Charles Duncan, Concord.

NEW MEXICO: Santa Fe, April 11. Sec., Dr. P. G. Cornish, Jr., 221 W. Central Ave., Albuquerque.

OKLAHOMA: Oklahoma City, March 8-9. Sec., Dr. J. M. Byrum, Shawnee.

RHODE ISLAND: Providence, April 7-8. Dir., Dr. Lester A. Round, 319 State Office Building, Providence.

WEST VIRGINIA: Charleston, March 22. Sec., Dr. W. T. Henshaw, Charleston.

Indiana Reciprocity Report

Dr. William R. Davidson, secretary, Indiana State Board of Medical Registration and Examination, reports 43 physicians licensed by reciprocity with other states during 1931. The following colleges were represented:

College	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
College of Medical Evangelists	(1930)	Michigan, Tennessee
Chicago College of Medicine and Surgery	(1913)	Illinois
Hahnemann Medical College and Hospital, Chicago	(1889)	Illinois
Loyola University School of Medicine	(1926), (1928)	Illinois
Northwestern University Medical School	(1930)	Illinois
Rush Medical College	(1923), (1929)	Illinois
University of Illinois College of Med.	(1929), (1930, 2)	Illinois
State University of Iowa College of Medicine	(1902)	Iowa
University of Louisville Medical Department	(1915)	Kentucky
University of Louisville Sch. of Med.	(1925), (1926), (1929)	Kentucky, (1929) Ohio
College of Physicians and Surgeons of Baltimore	(1891)	N. Carolina
Johns Hopkins University School of Med.	(1917), (1927)	Maryland, (1926) Pennsylvania
Detroit College of Medicine and Surgery	(1927)	Michigan
University of Michigan Homeopathic Medical School	(1913)	Michigan
University of Michigan Dept. of Med. and Surg.	(1914)	Michigan
University of Michigan Medical School	(1924)	Maryland, (1925), (1926), (1927), (1929) Michigan
University of Minnesota Medical School	(1927)	Minnesota
Syracuse University College of Medicine	(1920)	New York
Eclectic Medical College, Cincinnati	(1929)	Kentucky
Ohio State University College of Medicine	(1924), (1926)	Ohio
University of Cincinnati College of Medicine	(1927)	Ohio
Jefferson Medical College of Philadelphia	(1928)	Penna.
Temple University School of Medicine	(1928)	Ohio
University of Nashville Medical Department	(1909)	Alabama
Milwaukee Medical College	(1910)	Wisconsin
University of Toronto Faculty of Medicine	(1921)	Illinois, (1923) Michigan
University of Athens School of Medicine, Greece	(1915)	W. Virginia

Hawaii October Examination

Dr. James A. Morgan, secretary, Hawaii Board of Medical Examiners, reports the written examination held at Honolulu, Oct. 12-15, 1931. The examination covered 10 subjects and included 55 questions. An average of 75 per cent was required to pass. Six candidates were examined, all of whom passed. The following colleges were represented:

College	PASSED Year Grad.	Per Cent
Indiana University School of Medicine	(1930)	82.2
State University of Iowa College of Medicine	(1930)	76.4
University of Louisville School of Medicine	(1931)	79.9
University of Michigan Medical School	(1930)	78.7
Washington University School of Medicine	(1930)	84.3
University of Vermont College of Medicine	(1931)	82.1

Arkansas November Report

Dr. Sam J. Allbright, secretary, State Medical Board of the Arkansas Medical Society, reports the written examination held at Little Rock, Nov. 10-11, 1931. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Eleven physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED Year Grad.	Per Cent
Barnes Medical College, St. Louis, Mo.	(1899)	79

College	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
Rush Medical College	(1897) California, (1930)	Illinois
Tulane University of Louisiana School of Med.	(1930, 2)	Louisiana
Washington University School of Medicine	(1929), (1930)	Missouri
University of Nashville Medical Department	(1908)	Tennessee
University of Tennessee College of Medicine	(1925) (1916), (1930), (1931)	Louisiana, Tennessee

Ohio October Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports 34 physicians licensed by reciprocity with other states and 3 physicians licensed by endorsement of credentials at a meeting held Oct. 6, 1931. The following colleges were represented:

College	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Colorado School of Medicine	(1929)	Colorado
Howard University School of Medicine	(1930)	Maryland
Rush Medical College	(1926)	Maryland
Indiana University School of Medicine	(1910), (1925)	Indiana
State University of Iowa College of Med.	(1928), (1930)	Iowa
University of Kansas School of Medicine	(1931)	Kansas
Kentucky School of Medicine	(1893)	W. Virginia
University of Louisville School of Medicine	(1928)	Kentucky
Baltimore Medical College	(1905) Pennsylvania, (1907)	Colorado
Johns Hopkins University School of Med.	(1928), (1931)	Maryland
University of Michigan Medical School	(1919) (1927), (1928, 2), (1929, 2), (1930, 4)	New York, Michigan
St. Louis University School of Medicine	(1930)	Missouri
New York Homeopathic Medical College and Hospital	(1906)	New York
Hahnemann Medical College and Hospital of Philadelphia	(1929), (1930, 2)	Penna.
Temple University School of Medicine	(1917), (1927)	Penna.
Woman's Medical College of Pennsylvania	(1908) (1910)	Penna., Maryland
University of Toronto Faculty of Medicine	(1923)	Michigan

College	LICENSED BY ENDORSEMENT Year Grad.	Endorsement of
University of Michigan Medical School	(1930)	N. B. M. Ex.
Columbia University College of Phys. and Surgs.	(1929)	N. B. M. Ex.
Woman's Medical College of Pennsylvania	(1930)	N. B. M. Ex.

District of Columbia Reciprocity Report

Dr. W. C. Fowler, secretary, Commission on Licensure, reports ten candidates licensed by reciprocity with other states from Jan. 30 to Dec. 9, 1931. The following colleges were represented:

College	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
College of Medical Evangelists	(1915) Maryland, (1917)	California
University of Colorado School of Medicine	(1930)	Maryland
George Washington University Medical School	(1928)	Maryland
Baltimore University School of Medicine	(1896)	Maryland
College of Physicians and Surgeons of Baltimore	(1893)	New York
Maryland Medical College, Baltimore	(1912)	Maryland
University of Michigan Medical School	(1922)	Michigan
Medical College of Virginia	(1929)	Virginia
Osteopath		Iowa

Montana October Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held at Helena, Oct. 6-7, 1931. The examination covered 10 subjects and included 50 questions. An average of 75 per cent was required to pass. Five candidates were examined, all of whom passed. Two physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED Year Grad.	Per Cent
Emory University School of Medicine	(1926)	83.9
Rush Medical College	(1931)	85.7
University of Illinois College of Medicine	(1931)	85.3
University of Michigan Medical School	(1930)	84.1
University of Oregon Medical School	(1931)	83.9

College	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Michigan Medical School	(1926)	Michigan
Columbia University College of Phys. and Surgs.	(1905)	Iowa

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Book Notices

History of Medicine in the United States. By Francis R. Packard, M.D. In two volumes. Cloth. Price, $12 per set. Pp. 1323, with 103 illustrations. New York: Paul B. Hoeber, Inc., 1931.

Previous to the publication of this contribution the foremost history of medicine in America was the book by Mumford. The story of medicine in America is some 200 years old. Much of our development is the reflection of work done abroad, but there has been a melting pot of science as well as a melting pot of races and nations—to the advantage of medicine. Dr. Packard has not attempted an evaluation of the recent development of foundations for research and great institutes for medical education. His consideration practically ends with the beginning of the present century.

Quite recently many of the states have been developing individual histories which are exceedingly valuable. These are reflected in Dr. Packard's book. In his first volume he considers medical legislation, education and hospitals during the earliest period, the medical profession in the war for independence and the history of the medical department of the army up to the close of the Spanish-American War. The second volume provides a history of the medical department of the United States Navy and of the medical schools founded during the first half of the nineteenth century. The author then outlines the development of medical practice and education in some of the states and concludes with chapters on foreign influences in American medicine, notable events in American medicine and surgery, and the beginnings of specialism in America. There are numerous appendixes of interest, including particularly reprints of early lectures and documents, a list of the surgeon generals of the United States Army, a discussion of the ether controversy, and a record of the *American Journal of the Medical Sciences* and the *Boston Medical and Surgical Journal*. There are sections on homeopathic medical colleges and on women in medicine, on physiomedical and electric colleges, and finally a bibliography and a well prepared index.

It is safe to say that what Dr. Packard has here contributed is excellent. The reader should not, however, consider the book as in any sense of the word an adequate history of medicine in the United States. There is so much missing in so many fields that space is not available to begin to list what is absent. For instance, the section on the history of medicine in Illinois, beginning on page 850, is inadequate from numerous points of view. If Illinois, which has had so much consideration by medical historians, is so poorly handled, other states must suffer even more. The part played by the American Medical Association in the development of American medicine has either been intentionally minimized or else is sadly unappreciated by Dr. Packard.

These two volumes may therefore be considered a collection of interesting notes on the history of medicine in America, reflecting Dr. Packard's personal interests, and beyond that in no sense of the word an adequate record of events from the point of view either of completeness or of historical perspective. It is idle to speculate as to the reasons for the failure of Dr. Packard to provide an adequate story, but the fault must lie in a failure to appreciate American medicine as a whole. Dr. Packard himself recognizes in his preface the unevenness of the material and the numerous omissions. However, in view of this recognition it might have been better to reflect in the title of the work its actual character as a collection of essays rather than a history.

Opuscula selecta Neerlandicorum de arte medica. Fasciculus nonus quem curatores miscellaneorum quae vocantur Nederlandsch Tijdschrift voor Geneeskunde. Leeuwenhoek. Collegerunt et ediderunt Amsterdam Sumptibus Societatis. Cloth. Pp. 145, with illustrations. Amsterdam: Sumptibus Societatis, 1930.

In the preface, G. van Rijnberk describes how it has come about that certain of the earliest scientific letters of van Leeuwenhoek, the great microscopist, 1632-1732, which were thought to be lost, at length came to light. E. C. van Leersum reviews the letters of van Leeuwenhoek, "the pioneer of the microscope," on his varied observations to the Royal Society in London. Clifford Dobell, who was the first to draw attention to the existence of the letters published in this volume, contributes a valuable historical and bibliographic notice. J. G. de Lint writes an interesting chapter about the portraits of van Leeuwenhoek, a sturdy figure, some of which are reproduced at the end of the volume. The original Dutch text and the English translation of the hitherto unpublished letters by van Leeuwenhoek forms the main part of the book. There are facsimile reproductions of several of the letters and also of drawings by their author. The book will interest greatly students of the history of medicine and of science in general. It is an appropriate and important addition to the valuable series of historical textbooks in which it is published.

Industrial Hygiene for Engineers and Managers. By Carey P. McCord, M.D., Medical Director, The Industrial Health Conservancy Laboratories, Cincinnati, Ohio. Assisted by Floyd P. Allen, M.D. Cloth. Price, $5. Pp. 336, with 63 illustrations. New York: Harper & Brothers, 1931.

As stated in the introduction to this extraordinarily fine contribution to the subject of occupational disease, the application of adequate industrial measures is believed to be now limited to less than 5 per cent of this country's industries. Such knowledge as is now available has grown out of contributions by various governmental, social and trade bodies. The average physician has some general knowledge of the subject, but his knowledge is seldom systematized so as to be directly applicable to any given industry. The material contained in the contribution by Dr. McCord and Allen has been the basis of a course given to students in the Engineering College of the University of Cincinnati. Beginning with the introduction, which outlines the character of the problem, sections are devoted to emergency aid for the industrially injured, and to infection and disinfection. Then come several classifications of occupational diseases, with a long list of hazards presented in alphabetical order, and a long list of trades and industries in which occupational diseases may arise. The material is also listed according to the hazards and occupations affected. Further chapters concern the sanitation of factories, industrial fatigue, physical examinations, the conduct of a medical department, questions of compensation, diet, the utilization of the handicapped, and the work of mutual benefit associations. The physician will find no quarrel with this book from the point of view of recommendation of socialized schemes or of tendencies in industries leading to the breaking down of the relationship between the physician and his patient. He will find instead a vast amount of information briefly and succinctly presented by men who have specialized in the field concerned and who write with authority. An extensive index makes the book especially useful to the average reader.

Praktikum der physiologischen Chemie. Teil 1: Fermentmethoden. Von Peter Rona. Second edition. Paper. Price, 18.60 marks. Pp. 420, with 107 illustrations. Berlin: Julius Springer, 1931.

This book is devoted solely to ferments and particularly to the ferments found in the animal body. It is especially valuable for workers and investigators in the field of fermentation. Methods of preparation and the determination of activity are treated quite thoroughly. The book has an adequate index. The language is simple, the style clear and direct. The literature quoted is not voluminous but is carefully selected. The volume is divided into two parts, general and special. Under general properties the author discusses preparation, adsorption, elution or the freeing of ferments from combination, dialysis, electrodialysis, conservation, measurement of activity, specificity, influence of temperature and reaction, activating and paralyzing agents. Details of chemical and physical processes and methods are described clearly and accurately, so that the laboratory worker will have little difficulty in carrying out the methods. The special part is devoted to the methods of preparing and studying the action of lipases, esterases, carbohydrate splitting ferments, glycolysis, pepsin, chymosin, trypsin, enterokinase, erepsin, nucleases, amicases and catalases. Each subject is fully treated; for example, two leading methods are given for the preparation of pepsin, and fourteen methods for the estimation of its activity. The description of such physical apparatus as the polariscope, refractometer and colorimeter is complete—perhaps more so than necessary; yet an examination of the book as a whole gives the impression of compactness, completeness, selectiveness and reliability.

Successful Living in This Machine Age. By Edward Albert Filene and Charles Wesley Wood. Cloth. Price, $2.50. Pp. 274. New York: Simon & Schuster, Inc., 1931.

Mr. Edward A. Filene has for years been noted as a public spirited citizen, a successful merchant, and a man who believes that the elementary ideas which make for successful merchandising can be equally applied in other fields. He was instrumental in aiding Lincoln Steffens in the investigation of Boston politics, made many years ago. He has also been a member of the Committee on the Costs of Medical Care since its foundation, and is indeed credited with the idea behind this committee and its work. He himself established the Twentieth Century Foundation, which has aided many important social endeavors.

In his new book, Mr. Filene shows the value of organization for lowering the cost of overhead and for distribution of the expense. Some years ago he contributed to THE JOURNAL a paper urging the formation of medical guilds, which were essentially groups, in the belief that group practice would take care of the problem of providing good medical service to all at a price they could afford to pay. In his present book he carries this idea further, but apparently his experience on the Committee on the Costs of Medical Care has made him somewhat doubtful of the certainty that the group is the answer to the problem of medical costs. Mr. Filene writes succinctly, with humor, and his views are interesting.

Studien zur Entwicklung der menschlichen Lungenphthise: II. Phthisische Entwicklungen aus den Reihen des Frühinfiltrates und des frühen phthisischen Nachschubes. Von Hermann Braeuning und Franz Redeker. Nr. 39. Tuberkulose-Bibliothek. Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Prof. Dr. Lydia Rabinowitsch. Paper. Price, 22 marks. Pp. 112, with 100 illustrations. Leipzig: Johann Ambrosius Barth, 1931.

The book consists of case reports, serial x-ray films and carefully studied comments on the earliest film signs of focal development in the tuberculous. The work deals at length with the subject of successive infiltrations (Schuebe). An interesting series of roentgenograms demonstrates the progress of the process from the minimal to the grosser lesion. The subject is more easily understood if recourse is had to the first report on it by the same authors. The writers raise the question Can one differentiate between a really new focus and a perifocal inflammatory reaction of an old focus which is buried, so to speak, in an infiltrated area? Arguing the matter, they say that if one accepts the views of Romberg it is easy to recognize that early infiltrations may arise from previously existing small isolated foci. It is quite another thing, say the authors, whether early infiltrations, the term being used in its strictest sense, can be recognized roentgenographically when they are of pin-head size; this presupposes that the disease process is located in hitherto healthy lung. This is an important and practical question. The authors are candid and frank in their statements, acknowledging the difficulty of determining the points at issue. They admit that their long study has not given them incontrovertible and typical examples from which conclusions may be drawn. The work done proves once more the immense value of serial x-ray plating, carefully done and studied. It also shows the value of constant control of tuberculosis workers. Of these, the authors believe, far more become infected than is generally believed. The little work appears to be of unusual importance. It should be checked by competent roentgenologists.

Lane Lectures on Experimental Pharmacology and Medicine. By Rudolf Magnus. Stanford University Publications, University Series, Medical Sciences, Volume II, No. 3. Paper. Price, $1. Pp. 108, with 42 illustrations. Stanford University: Stanford University Press, 1930.

This monograph contains three of the five Lane medical lectures that were to have been delivered in 1927 by the late Professor Magnus. Only these three lectures were completed at the time of the sudden death of Magnus in Pontresina, Switzerland. The three lectures concerned the experimental pathology of the lungs, choline as an intestinal hormone, and the physiologic *a priori*. The last lecture is partly an interesting philosophic dissertation and partly a discussion of Magnus's work on the labyrinth. The first two lectures deal with favorite experimental problems which Magnus and his pupils investigated with great skill. The work on lungs appears to have been stimulated by some experiences of Magnus with poison gases during the World War. The work with choline was suggested by a chance observation of one of his assistants, who showed that a saline solution in which was bathed a piece of intestine acquired the property of stimulating a normal piece of intestine. Studies of this phenomenon ultimately showed the practical usefulness of choline as a remedial measure in intestinal paresis and paralytic ileus. Each lecture has a list of references. Besides the lectures by Magnus, the monograph contains a biographic sketch of Magnus by H. H. Dale of London, a short preface by P. J. Hanzlik of San Francisco, a list of Magnus's works by deKleijn of Utrecht, and an excellent portrait of Magnus. This monograph is in a sense a memorial volume issued by Stanford University in honor of her most illustrious Lane lecturers.

The Official History of the Australian Army Medical Services in the War of 1914-1918. Volume I: Part 1. The Gallipoli Campaign. By Colonel A. G. Butler, D.S.O., V.D., B.A.; Part 2. The Campaign in Sinai and Palestine. By Colonel R. M. Downes, C.M.G., V.D., M.D.; Part 3. The Occupation of German New Guinea. By Colonel F. A. Maguire, D.S.O., V.D., M.D., and Captain R. W. Cilento, M.D., B.S., D.T.M.& H. Cloth. Price, $3.25. Pp. 873, with 228 illustrations. Melbourne: Australian War Memorial, 1930.

Australia was not responsible for the complete organization of any military force during the World War apart from the expedition to New Guinea. The policy of the Australian medical units was that of the British forces with whom they were associated. This volume is a presentation of the experiences of the Australian Army Medical Service. It is divided into three parts: (1) the Gallipoli Campaign, (2) the Campaign in Sinai and Palestine, and (3) the Occupation of German New Guinea. The administrators of the medical service of the Australian forces were almost without exception civil practitioners who suddenly became responsible for the medical administration of a large military organization. The editor shows the difficult problems that confronted officers who had so little time to prepare for extensive military work. In addition to the Australian records, England made available to the editor records of the British army, which together make the history complete. This and the succeeding volume of the history of Australian medical forces will be unique in that it will show historically the details of a close and successful cooperation between two different medical services. The problems of the Australian medical officers are exhibited in the order in which they arose. The various chapters discuss the evolution of the Australian army medical service, mobilization of the A. I. F.; the first convoy; strategic preparations; the landing at Gaba Tepe; the expeditionary base; disease at Gallipoli; supreme effort: Sari Bair; the disease debacle; the rush of sick; Lemnos; the evacuation; pathology; the service in Australia; defense of the Suez Canal; health in the desert; the first Amman raid in the Palestine campaign; the dash to Damascus; the advance through Syria; the capture of Rabaul.

A Thousand Marriages: A Medical Study of Sex Adjustment. By Robert Latou Dickinson and Lura Beam. Foreword by Havelock Ellis. Medical Aspects of Human Fertility Series. Issued by the National Committee on Maternal Health, Inc. Cloth. Price, $5. Pp. 482, with illustrations. Baltimore: Williams & Wilkins Company, 1931.

The last five years has witnessed a flood of volumes on sex and sex life. Many of the most important contributions have come from American investigators, for instance Dr. Katharine B. Davis, Dr. G. V. Hamilton and Dr. Robert L. Dickinson. The present volume includes an aspect of the subject not covered in previous communications—the physical side. Dr. Dickinson as a gynecologist was concerned not only with mental disturbances but also with the actual physical structure of his patients, which in some instances may have been the responsible factor in marital failure. He is, however, a practical psychologist and has not permitted the physical point of view to obliterate the equally important psychologic considerations. The introduction by Havelock Ellis is philosophical. The Committee on Maternal Health has cooperated in the assembling of the data and the book may be considered a sound contribution to this field.

In the opening section the nature of the study is set forth; then come considerations of the new bride, frigidity, passion and dyspareunia. The third section deals with adjustment, fertility, widows and the necessary normal controls. Then comes the opposite group with the headings maladjustment,

fear, substitution and compensation, conflict of education, and separation and divorce. The last two chapters are devoted to passion and frigidity and to a summary of the significant facts brought out by the study. In an appendix there appears an outline for a suitable case history in this field, a proper development of such a case history and a topical analysis of the points of the various chapters.

The book is based on approximately a thousand case histories, which are cited in sufficient detail to teach the lessons they are planned to teach. Space is not available in a book review even to outline the important facts brought out in this volume. Indeed, most of the points are probably familiar to every physician. The consideration is good and the demonstration of the relationship of these physical and sexual factors to successful marriage should be well established in the physician's mind.

Ergebnisse der Kreislaufforschung. Monographien aus dem Gebiete beschreibender, experimenteller und klinischer Kreislaufforschung. Herausgegeben von Dr. Med. Bruno Kisch, ord. Professor der Physiologie an der Universität Köln. Band I: Die reflektorische Selbststeuerung des Kreislaufes. Von Prof. Dr. Med. Eberhard Koch, Abteilungsvorstand am Kerckhoff-Institut in Bad Nauheim. Paper. Price, 18 marks. Pp. 234, with 44 illustrations. Dresden: Theodor Steinkopff, 1931.

This book will prove interesting and profitable reading to the physiologist and clinician interested in cardiovascular problems in health and disease. Many of the older physiologists will find it necessary to change their interpretation of many vascular and cardiac phenomena on the basis of the pressoreceptor reflexes resulting from stimulation of the aortic and carotid sinus nerves (and perhaps others distributed to other larger vessels of the arterial circulation). The reflexes are described in terms of their comparative anatomy, physiology, pathology and pharmacology. The book is well written by one who has added his share to the knowledge of the quantitative aspects of the physiologic responses discussed in the volume. A comprehensive bibliography is appended. The clinician will find the book of practical interest and significance in his daily work.

International Studies on the Relation Between the Private and Official Practice of Medicine with Special Reference to the Prevention of Disease. Volume II: Belgium, France, Italy, Jugo-Slavia, Hungary, Poland and Czecho-Slovakia. Conducted for the Milbank Memorial Fund. By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Cloth. Price, $4. Pp. 249. Baltimore: Williams & Wilkins Company, 1931.

The first volume of the series called "International Studies" dealt with the Netherlands, Scandinavia, Germany, Austria and Switzerland. The present volume is concerned with Belgium, France, Italy, Yugoslavia, Hungary, Poland and Czechoslovakia. The second volume follows the plan of the first. It considers the nature of health administrations in the various countries, the different social organizations involved and the nature of the medical profession, and discusses the uses of insurance to provide good medical care for all. With a background of much experience in this field, Dr. Newsholme is not moved to ecstacy by every social scheme. As a scientist he views what he sees objectively. Any one wishing a world survey of progress in this field and in health management will find in this series of volumes the best assembling of data thus far available. The third volume will concern conditions in England and Wales, Scotland and Ireland, and a final volume will summarize the subject and make suggestions for further progress.

The Prevention of the Diseases Peculiar to Civilization. By Sir W. Arbuthnot Lane, Bart, C.B., Consulting Surgeon to Guy's Hospital and to the Hospital for Sick Children, Great Ormond Street. Paper. Price, 2/-. Pp. 99, with 44 illustrations. London: Faber & Faber, Ltd., 1931.

This volume was first published in 1929 and is now issued in a cheap edition for general use. In the field of public health education, Sir William Arbuthnot Lane has been a pioneer and merits credit for his service notwithstanding his promotion of occasional departures from scientific medicine. The book deals largely with the fundamental laws controlling the operation of the human body and promotes the view that nature's method is best. Of course, one has to interpret nature's method and to realize that modern civilized man lives in conditions that in no way resemble what may be natural conditions. Unfortunately, in his health teachings Sir William Arbuthnot Lane has also concerned himself with the promotion of various proprietary foods in which his health society seems to have some commercial interest and his views must be read, therefore, with the reservations that such a connection naturally invites.

Fundamentals of Health: The Human Organism, Its Development and Conservation. By T. Bruce Kirkpatrick, Associate Professor of Physical Education, Columbia University, and Alfred F. Huettner, Associate Professor of Biology, New York University. Cloth. Price, $3.80. Pp. 576, with 100 illustrations. Boston: Ginn & Company, 1931.

It is quite difficult to arouse interest in the subject of hygiene and health in college people. Textbooks that have previously been used for instruction in these fields have been so devoid of interest that the result of their study has only been the production of apathy and boredom, if not outright hostility. These authors have attempted to include material that would be more interesting to the student, and their book has been planned mostly from this standpoint. They noted that material dealing with heredity, man's biologic background and embryonic development have aroused the greatest interest of the student, and for this reason the first portion of the book is devoted to these subjects. Then follow chapters on foods, nutrition, muscles, respiration, nervous system, sex reproduction, the internal secretions, and public health. The material is clearly presented and is well illustrated. A sensible attitude has been taken toward matters under dispute and the best of authorities are quoted. This volume should establish itself quickly as a valuable textbook for the teaching of health.

Contribuição ao estudo da biologia do "Strongyloides stercoralis." A' margem de um caso raro, provavelmente inédito, de estrongyloidose. Por Heitor Praguer Fróes. These de concurso á cathedra de medicina tropical na Faculdade de Medicina da Bahia. Paper. Pp. 123, with 21 illustrations. Bahia: A Nova Graphica, 1930.

The author has published an extended account of his studies on the larvae of Strongyloides stercoralis discovered in the pericardial fluid and the pleural exudate of a native of Bahia, Brazil. He discusses in successive sections the classification, life cycle, means of infection, and pathologic results of the invasion of the parasite. An important item is his list of the occurrence of such larvae in unusual locations in the body of the host. While the author has been able to contribute little that is new, the account is unusually complete and accurate. It will serve as a most valuable summary of knowledge for all workers desiring such an account in the Portuguese language.

One Hour of Medical History. Compiled by Benjamin Spector, M.D. Boards. Price, $1. Pp. 88, with portraits. Boston: Beacon Press, Inc., 1931.

This volume, prepared by students in Tufts College Medical School, is in the form of a pageant in which students, representing various famous figures in medical history, speak of the work of these noted men. The fact that students of appropriate nationalities were chosen adds to the interest of this unusual item.

Human Heredity. By Erwin Baur, Eugen Fischer and Fritz Lenz. Translated by Eden and Cedar Paul from the third German edition. Cloth. Price, $8. Pp. 734, with 181 illustrations. New York: Macmillan Company, 1931.

This English translation of one of the most authoritative works available in Germany is made from the third German edition, published in 1927. During the course of preparation, revisions and additions were supplied by the authors, so that this new edition may be considered complete and down to date. The book is divided into sections for which the various authors are responsible. The general theory of variation and heredity is discussed by Dr. Baur; racial differences in mankind are discussed by Fischer; the last three sections of the book, developed by Lenz, deal with morbific factors in heredity, methods for the study of human heredity, and the inheritance of intellectual gifts.

More and more consideration is being given in these times to the importance of constitution and heredity for the health, longevity and happiness of mankind. Physicians are fortunate, therefore, in having available such a systematic and sound con-

sideration of the subject. The ability of the translators to interpret correctly and in good English writings originally in German has been demonstrated in many previous volumes for which they have been responsible. This book may be highly recommended to every medical reader who desires to be well grounded on the important relationships of constitution and heredity to the problems of disease. Especially to be recommended is an excellent index, which is an essential portion of this work.

Medicolegal

Weight of Evidence Required to Prove Malpractice

(Matteson v. Thiel (Wash.), 298 P. 333)

Mrs. Matteson was subjected to an abdominal operation in 1915, and two others for the same trouble, one in 1922 and another in 1923. They were all performed by physicians other than the defendant in this case. In June, 1927, the defendant operated on her for the same condition for which the previous operations had been done. After this operation she suffered pain in the lower left abdominal region until June, 1929, when another physician removed a surgeon's needle from the region in which the pain had been. She and her husband thereupon sued the defendant, blaming him for having left the needle in her abdomen.

The plaintiff testified that prior to the operation done by the defendant she had had no pain such as that she suffered after he operated and that she had no such pain after the needle was removed. The needle that was removed was admitted by the defendant to be such a needle as he and other surgeons commonly use in the operation that was performed, but he denied that he had left the needle in his patient's abdomen. The testimony on behalf of the plaintiff tended to show, however, that all needles used and available in the three operations prior to the one performed by the defendant were accounted for, and that not one of them was left in her body. In the course of the trial, on request of the defendant-physician, the court instructed the jury as follows:

> You are instructed that where circumstantial evidence is relied upon to establish a cause of damage or injury, mere circumstances in a case of this kind are not sufficient to establish a case against the defendant, unless they exclude every reasonable hypothesis of other operating surgeons having inadvertently left the needle in the plaintiff. If the circumstances do not exclude such an hypothesis as unreasonable, your verdict must be for the defendant surgeon.

Judgment was rendered in favor of the defendant-physician, and thereupon the plaintiffs moved for a new trial. They based their motion in part on the instruction stated above, which they claimed was erroneous. They convinced the court of its error, and the court in granting a new trial, solely because of having given Instruction No. 6, set forth above, said:

> It, in effect, advises the jury that where circumstantial evidence is relied upon, the plaintiff cannot recover unless the circumstances exclude every reasonable hypothesis of other operating surgeons having, inadvertently, left the needle in the plaintiff, or, in other words, that the circumstantial evidence must prove the case beyond a reasonable doubt. In several other instructions the rule was correctly stated that the burden was upon the plaintiff to prove its case by a preponderance of the evidence. Instruction No. 6 is inconsistent with this rule.

From the order of the trial court granting the plaintiffs' motion for a new trial, the defendant-physician appealed to the Supreme Court of Washington.

In the opinion of the Supreme Court, the remarks of the trial judge set forth above correctly described the situation. The defendant-physician, however, in arguing in support of his appeal, contended that even though Instruction No. 6 was in itself erroneous, the error had been cleared up by other instructions. The Supreme Court, however, regarded the fact that certain of the instructions given by the trial court were correct as insufficient to justify it in reversing the order of the trial court granting a new trial, citing in support of its position previous cases in which the Supreme Court itself had held that where the instructions are irreconcilable and set up for the guidance of the jury contradictory rules, it is impossible for the court to say which instruction the jury followed in arriving at its verdict. The Supreme Court therefore affirmed the order of the trial court granting the plaintiffs' motion for a new trial.

Wills: Presumption as to Testator's Sanity.—In determining the mental status of a testator it will be presumed that he was sane. Where a will appears to be a rational act, performed in a rational manner, this presumption and the apparently rational act amount to evidence of testamentary capacity. The fact that a testator has been adjudged incompetent to manage his property and business affairs and that a guardian had been appointed prior to the date the will was executed is evidence of incompetence which may be overcome by other evidence, showing that the testator was mentally competent at the time of the execution of his will.—*Peace v. Peace (Okla.), 299 P. 451.*

Evidence: Right of an Examining Physician to Express an Opinion Concerning a Wound.—It is the general rule, according to the court of criminal appeals of Texas, that a physician who has testified with respect to his examination of a wound may express an opinion as to its probable cause, nature, effect and consequences.—*Wharton v. State (Texas), 38 S. W. (2d) 72.*

Workmen's Compensation Acts: Jurisdiction over Physicians' Claims.—Under the workmen's compensation act of California, proceedings by a physician or by a hospital before the industrial accident commission to recover the value of services rendered an injured employee are subordinate to proceedings by the employee to recover compensation. They cannot be considered independently by the industrial accident commission.—*Pacific Employers' Ins. Co. v. French (Calif.), 298 P. 23.*

Workmen's Compensation Acts: Liability of Employer for Malpractice of Physician.—An employer furnishing medical aid to an injured employee is bound only to exercise reasonable care in selecting his physician. If he exercises that care, he is not liable for his physician's negligence. Where a physician, properly selected by an employer, ordered that an injured employee be taken by automobile to a hospital some fifty miles away, and prescribed the treatment to be administered on the journey by a layman accompanying the patient, the employer was held to be not liable for the employee's death from loss of blood before reaching his destination.—*Stanley's Adm'r v. Duvin Coal Co. (Ky.), 36 S. W. (2d) 630.*

Evidence: Admissibility of Coroner's Verdict.—The verdict of a coroner may be received in evidence to prove that death occurred, but not to show the cause of death.—*Childers v. National Life and Accident Ins. Co. (Mo.), 37 S. W. (2d) 490.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Mobile, April 19-22. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association for Thoracic Surgery, Ann Arbor, Mich., April 18-20. Dr. Duff S. Allen, 3720 Washington Blvd., St. Louis, Sec'y.

American Association of Anatomists, New York, March 24-26. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.

American Association of Physical Anthropologists, Washington, D. C., March 21-23. Dr. D. J. Morton, 632 W. 168th St., New York, Sec'y.

American College of Physicians, San Francisco, April 4-8. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.

Arizona State Medical Association, Globe, April 21-23. Dr. D. F. Harbridge, 407 Goodrich Building, Phoenix, Secretary.

Arkansas Medical Society, Little Rock, April 5-7. Dr. William R. Bathurst, 814 Boyle Building, Little Rock, Secretary.

Medical Society of the Missouri Valley, Omaha, Neb., April 5-7. Dr. Joseph D. McCarthy, 107 South 17th Street, Omaha, Secretary.

Mississippi State Medical Association, Jackson, April 12-14. Dr. T. M. Dye, Clarksdale, Secretary.

North Carolina, Medical Society of the State of, Winston-Salem, April 18-20. Dr. L. B. McBrayer, Southern Pines, Secretary.

South Carolina Medical Association, Columbia, April 19-21. Dr. E. A. Hines, Seneca, S. C., Secretary.

Tennessee State Medical Association, Memphis, April 12-14. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Annals of Otol., Rhinol. and Laryngology, St. Louis

40: 987-1306 (Dec.) 1931

*Evaluation of Caloric and Rotation Tests. L. Fisher, Philadelphia.—p. 987.
Osteomyelitis of Skull: Osteogenetic Processes in Repair of Cranial Defects. A. C. Furstenberg, Ann Arbor, Mich.—p. 996.
Rhinosporidium. W. L. Hanson, East St. Louis, Ill.—p. 1013.
Congenital Atresia or Obstruction of Nasal Air Passages. V. P. Blair, St. Louis.—p. 1021.
Scientific Aspects of Work of American Federation of Organizations for the Hard of Hearing. E. P. Fowler, New York.—p. 1036.
Comments on Changes Occurring in Medical Practice: President's Address. C. H. Bowers, Los Angeles.—p. 1049.
Microscopic Observations of Eustachian Tube. Dorothy Wolff, St. Louis.—p. 1055.
Otolaryngologic Aspects of Commercial Aviation. R. A. Fenton, Portland, Ore.—p. 1070.
*Prognostic Significance of Sinusitis in Children. L. Richards, Boston.—p. 1076.
Management of Fractured Nose. E. F. Risdon, Toronto.—p. 1094.
Diagnosis and Conservative Treatment of Sphenoid Suppuration. W. A. Wagner, New Orleans.—p. 1099.
*Mastoiditis in Infants: Review of Literature with Summary of Cases Studied. W. H. Johnston, Santa Barbara, Calif.—p. 1115.
Endotracheal Anesthesia: New Technic. A. E. Guedel, Beverly Hills, Calif., and R. M. Waters, Madison, Wis.—p. 1139.
Acute Generalized Bronchiolectasis with Bullous Emphysema. O. McGillicuddy, Denver.—p. 1146.
Progressive Osteomyelitis of Cranial Bones Secondary to Suppurative Nasal Sinusitis. C. F. Yerger, Chicago.—p. 1164.
Streptothrix Infections of Mastoid, Middle and External Ear. R. C. Martin, San Francisco.—p. 1171.
Decompression of Facial Nerve for Postoperative Facial Paralysis: Two Cases. J. M. Smith, New York.—p. 1179.
Development of Head Lights and Introduction of a New Light. P. Good, Chicago.—p. 1184.

Evaluation of Caloric and Rotation Tests.—Fisher states that in the hands of the most expert examiners the caloric and rotation tests serve to diagnose the causes of vertigo in general, to differentiate between supratentorial and subtentorial lesions in doubtful neurologic cases, and to aid in the localization of intracranial lesions. However, even in the hands of those only moderately expert the test can serve in a most definite manner to ascertain exactly the degree of viability of the labyrinth, to establish or rule out the existence of cerebellopontile angle lesions, and to detect early an actual or threatened intracranial invasion in cases of middle ear suppuration, acute or chronic.

Prognostic Significance of Sinusitis in Children.—According to Richards, sinusitis in children has become during the past ten years a well recognized entity, underlying local nasal symptoms and contributing to systemic disturbances in a relationship formerly never dreamed of. Certain types of sinusitis are amenable to local and, particularly in the acute cases, surgical treatment. Many cases of chronic sinusitis will defy all local measures, whether surgical or medical, and can be relieved only by investigation of the underlying physiologic and biochemical dysfunctions that exist in the individual patient. Allergic disorders will be found to play an important part in this connection. In general, the existence of nasal symptoms will be found to parallel the existence of a pathologic state in the sinus as evidenced by roentgen examination. The author believes that only by study and investigation with every clinical and laboratory facility at hand, principally in a hospital, can adequate study of these conditions be satisfactorily carried out.

Mastoiditis in Infants.—In his paper Johnston includes reports from observers in every section of this country and Europe, and with few exceptions the impression was that the so-called gastro-intestinal-mastoiditis syndrome in infants does exist. The most important objective observations are in the ear drum and canal. The most often recorded are drab or gray drum with loss of normal luster, fulness of Shrapnell's membrane, a sagging of the posterosuperior canal wall and obliteration of normal landmarks; in many cases a well developed suppurative otitis media is found at the first examination. Postauricular changes are most unusual. The author believes that all infants with a severe gastro-intestinal disturbance should have repeated ear examinations by a trained otologist. There is less danger to hearing in postauricular drainage than there is in often repeated myringotomies. No mastoid should be operated on unless there are definite objective manifestations in the middle ear and tympanic membrane. The surgical treatment should be done as rapidly as possible, and nature's attempt at repair should not be hindered by curetting away mucous membrane from the antrum. In view of the anatomic conditions found in the infant's ear—a relatively large eustachian tube, the presence in the nasopharynx of infective material and the position assumed for almost twenty-four hours a day—it is reasonable to deduce that a middle ear and mastoid infection would be the most probable condition produced. Regardless of whether the middle ear and mastoid infection is coincidental with or the etiologic factor in gastro-intestinal disturbances, it is a most important factor in the final outcome of the case.

Archives of Internal Medicine, Chicago

48: 1065-1244 (Dec.) 1931

*Sympathetic Activity in Certain Diseases, Especially Those of Peripheral Circulation. W. J. M. Scott and J. J. Morton, Rochester, N. Y.—p. 1065.
Electrocardiographic Studies of Effect of Anaphylaxis on Cardiac Mechanism. L. H. Criep, Pittsburgh.—p. 1098.
*Subacute Meningococcal Endocarditis. N. B. Gwyn, Toronto.—p. 1110.
*Effects of Exercise on Experimental Cardiac Infarction. D. C. Sutton and M. D. Davis, Chicago.—p. 1118.
Primary Carcinoma of Lungs: Pathognomonic Signs in Diagnosis. J. Polevski, Newark, N. J.—p. 1126.
*Use of Amidopyrine in Rheumatic Fever. M. P. Schultz, New York.—p. 1138.
Pigment Metabolism and Destruction of Blood in Addison's (Pernicious) Anemia. R. F. Farquharson, H. Borsook and A. M. Goulding, Toronto.—p. 1156.
*Brucella Infection of Brief Duration: Case. H. R. Leavell, Mary Poston and H. L. Amoss, Durham, N. C.—p. 1186.
Endermic Reaction in Brucella Infections. H. R. Leavell and H. L. Amoss, Durham, N. C.—p. 1192.
Peptic Ulcer: Association with Pulmonary Tuberculosis. M. Sturtevant and L. L. Shapiro, New York.—p. 1198.
Congestive Heart Failure: XI. Effect of Digitalis on Dyspnea and on Ventilation of Ambulatory Patients with Regular Cardiac Rhythm. T. R. Harrison, J. A. Calhoun and F. C. Turley, Nashville, Tenn.—p. 1203.
*Mechanisms of Contraction and Evacuation of Gallbladder. L. A. Crandall, Jr., Chicago.—p. 1217.
*Prophylaxis of Postoperative Pneumonia by Oral Hygiene: Preliminary Report. S. W. A. Franken, New York.—p. 1225.
Azotemia with Normal Kidneys Found Post Mortem: Possible Cause: Low Blood Pressure After Operation. T. S. Evans, New Haven, Conn.—p. 1231.
*Effect of Ingestion of Water and Dextrose Solution on Emptying Time of Normal Stomach. H. H. Kasabach, New York.—p. 1237.

Sympathetic Activity in Certain Diseases.—Scott and Morton call attention to the fact that pioneers have recently opened up important possibilities in the application of anatomic and physiologic knowledge of the sympathetic nervous system to several clinical syndromes. For the achievement of sound progress in this interesting field there is now needed the establishment of criteria by which to measure the sympathetic activity in the various systems. The effect of the temporary interruption of the extrinsic nerve supply to the large bowel by spinal anesthesia is offered as an index of the amount of sympathetic inhibition present in megacolon. For vascular diseases of the extremities, a simple, systematic test is outlined that distinguishes the effects of spasm and of occlusion. The vasoconstrictor stimuli to the area studied are interrupted by anesthesia, the effect of which on the surface temperature is compared with the similar response in normal persons. The authors have established the normal levels for spinal, general and conduction block anesthesia. In an individual case, if anesthesia is not accompanied by elevation of temperature in the cool distal part of the extremity, occlusion without spasm is present; if the skin temperature reaches the normal vasodilatation level, sympathetic vasoconstriction is responsible for the circulatory symptoms, and if the elevation is definite but not to this level, both occlusion and spasm participate. The differ-

ence between the highest temperature obtained and the normal vasodilatation level has been termed the occlusion index, as it measures the effect of organic obstruction to the peripheral circulation. Nerve block anesthesia is particularly useful in this vasomotor test on account of its simplicity and its freedom from discomfort. In doubtful or borderline cases its results should be checked with those of spinal or of general anesthesia. By these methods, valuable information in regard to the nature and the treatment of various types of vascular disease in the extremities is obtained. In the purely occlusive group, some compensatory mechanism releases the collateral and terminal vessels from vasoconstriction when the local circulation is seriously reduced. This does not obtain in the spastic group. The treatment for these two groups should be along radically different lines. The principle of treatment for purely occlusive disease is the obtaining of a more peripheral distribution of the reduced amount of blood available, while in spastic disease the treatment should be directed toward an augmentation of the local circulation by overcoming sympathetic vasoconstrictor spasm. Particularly valuable methods are hyperthermia, which produces temporary vasodilatation, sympathetic ganglionectomy for permanent effects, and interruption of the peripheral nerves in cases in which ganglionectomy is desirable but contraindicated by the patient's condition.

Meningococcal Endocarditis. — Gwyn reports the case of a woman who for eight months showed symptoms and physical signs customarily associated with infection of the heart valves by Streptococcus viridans—subacute bacterial endocarditis. Blood cultures in the last two weeks of the illness were positive for meningococci. Death took place as a result of invasion of the brain and spinal cord by the meningococci. The observations at necropsy agreed closely with those described as occurring in association with subacute bacterial endocarditis. Meningococci were recovered at necropsy from the meninges only. The lesions in the heart and kidney as described were apparently in accordance with those observations recorded at necropsy in cases of subacute bacterial endocarditis.

Exercise and Cardiac Infarction. — Sutton and Davis noted that a rest period of six days after infarction resulted in a small, well contracted scar without thinning of the ventricular wall in one dog. In four other dogs, exercise, within three days after operation, resulted in thin scars with aneurysmal bulging. Although there was some variation in the roentgen silhouette from time to time, it was noted that the final average did not show any evidence of hypertrophy or of dilatation. Adhesive pericarditis did not cause hypertrophy.

Amidopyrine in Rheumatic Fever.—According to Schultz, amidopyrine has been used widely as an effective antipyretic and analgesic in a variety of diseases. Excepting the results in typhoid, experience indicates that amidopyrine may be employed in daily doses of at least 3 Gm. without provoking symptoms of toxicity. Instances of idiosyncrasy are less frequent than with many other drugs of this type. In rheumatic fever it has been found effective in patients who are not relieved by other drugs or who are unable to tolerate them in therapeutic doses; and total daily doses of less than 2 Gm. have been found adequate in this disease. The feasibility of giving effective quantities without provoking untoward side actions, as well as the wide margin between therapeutic and toxic doses, renders this drug particularly valuable in the treatment of patients with rheumatic fever.

Brucella Infection.—Leavell and his associates present a case of Brucella infection with fever of seven days' duration. The possible significance of cases of such short duration is discussed, with regard to the possibility that the patients in whom they occur might subsequently become carriers and with regard to the development of cutaneous hypersensitiveness to Brucella and of agglutinins for Brucella antigens. The difficulty of diagnosing such a case by ordinary clinical methods is pointed out.

Contraction and Evacuation of Gallbladder.—Crandall found that sham feeding and direct stimulation of the vagus and splanchnic nerves in dogs, and psychic stimuli and the injection of epinephrine in human beings did not have any effect on the motility of the gallbladder. The gallbladders of dogs, when filled with brominized oil that is less than three times as viscous as bile, spontaneously empty about half of the oil in from eighteen to twenty-four hours. The gallbladders of dogs when filled with iodized oil of the usual relatively high viscosity spontaneously empty about half of the oil in from twelve to twenty-four hours when the resistance of the intramural portion of the common bile duct is eliminated. In fasting human subjects little tendency toward spontaneous emptying of the gallbladder is observed. In human subjects on a carbohydrate diet there is a tendency toward emptying of the gallbladder over a period of from twenty-four to forty-eight hours. It is concluded that the liberation of cholecystokinin by the action of fat or of acid in the intestine is the major factor concerned in the contraction and evacuation of the gallbladder that follow a mixed meal. Duodenal motility facilitates this process.

Postoperative Pneumonia: Prophylaxis.—By the use of a technic which he describes and which he has developed over the past five or six years, Franken believes that the mouth can be put into a reasonably clean, hygienic state before operation is performed. His preliminary report on 859 surgical cases in which definite preoperative oral care was given indicates a measurable drop in postoperative pneumonias. In the figures submitted, this drop amounts to two thirds, and as nothing was changed and no other measures were taken, it seems to point out the practical value of a standard preoperative oral routine. This routine can be established in any general hospital with comparatively small expenditure, but it requires constant cooperation and surveillance.

Emptying Time of Stomach.—The emptying time of the stomach was determined fluoroscopically by Kasabach in fifty healthy young college students after the ingestion of 500 cc. of water and of an equal quantity of 50 per cent dextrose solution containing a very small quantity of barium sulphate, with the subjects sitting or walking about, and in twenty cases with the subjects running continuously, between observations. The total number of experiments on the fifty students was 110. No difference was observed in the rate of emptying of dextrose solution and of water in either group. Exercise (running) seemed to produce a definite acceleration in the emptying time of the stomach. In these experiments, as exercise accelerated the emptying of the stomach it seems justifiable to conclude that dextrose solution in a palatable form could be administered to athletes before a contest in which readily available fuel is required, without fear of producing gastric retention.

Archives of Otolaryngology, Chicago

14: 699-860 (Dec.) 1931

*Tumors of Tonsil and Pharynx (357 Cases): II. Adenocarcinomas of Mixed Tumor Type (74 Cases). G. B. New and J. H. Childrey, Rochester, Minn.—p. 699.

*Id.: III. Malignant Tumors Exclusive of Adenocarcinoma of Mixed Tumor Type (220 Cases). G. B. New and J. H. Childrey, Rochester, Minn.—p. 713.

Treatment of Strictures of Oropharynx. G. M. Dorrance, Philadelphia. —p. 731.

Transillumination and Roentgenography of Maxillary Sinuses: Review. W. M. Gafafer, Baltimore.—p. 737.

*Effects of Some Drugs on Vestibular Response to Rotation. E. L. Ross, M. W. Fish and A. Olsen, Chicago.—p. 755.

*Observations Following Adenoidectomy. F. T. Hill, Waterville, Maine. —p. 775.

Relation of Nasal Sinuses to Asthma. H. G. Tobey, Boston.—p. 784.

*Postoperative Complications of Radical External Operation on Frontal Sinus. H. I. Lillie, Rochester, Minn.—p. 793.

Incidence of Acute Otitis Media in Infants and Young Children During 1930-1931: Variations in Clinical Picture. A. J. Cone, St. Louis. —p. 797.

Labyrinthine Capsule in Guinea-Pigs with Hyperparathyroidism. C. K. Gale and H. L. Jaffe, New York.—p. 815.

Adenocarcinomas of Tonsil and Pharynx.—New and Childrey believe that so-called mixed tumors, which might better be designated adenocarcinomas of mixed tumor type, are not rare in the pharynx or palate. The commonest situation is the palate. Seventy-four cases are reported. The origin of the tumor probably depends on embryonic displacement or enclaves. The tumors are formed of epithelial and connective tissue elements, and the cartilage or mucous tissue in them is not derived from epithelial cells which have differentiated to the extent that they can be recognized as epithelial cells. The tumors may occur at any age but are most common in the fourth decade. Men are affected a little more often than women. The tumors are occasionally discovered in examination of the

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throat. The average duration of the lesions is 4.58 years. Symptoms and signs that depend on the situation and extent of the tumor are variable and at times unusual. Most common is a sensation of irritation or soreness of the throat. Ordinarily the tumor is single, sessile, firm, circumscribed and movable, with a smooth nonulcerated surface, but variations occur in these features as do variations in size. The average diameter of the tumor when the patient comes for examination is 5 cm. Histologically, the tumor presents a complex structure formed by epithelial elements in varied arrangements on a matrix of cartilage or mucous tissue with which it is characteristically blended. The neoplasms are potentially malignant, for they may contain squamous cell epithelioma and they sometimes metastasize to the cervical lymph nodes. They should be completely removed surgically. Operation may be supplemented by diathermy, cautery or irradiation. Of seventy-four patients seen by the authors over a period of fourteen years, forty-eight were treated. Of these, 56.5 per cent had been treated previously, 32.6 per cent having had surgical treatment. Of the forty-eight patients treated, forty-one (85.5 per cent) were traced. Thirty-nine are alive an average of sixty-eight and a half months after treatment. In the group of thirty-nine living patients there are twenty-nine who have been free from symptoms for four years, fifteen for seven years, eight for nine years and four from eleven to thirteen years. Two patients died of the tumor thirty-five and a half months after examination. Twenty-six patients were not treated. Sixteen of these were traced and seven were found to be alive, but five of them still had tumors. Nine patients are known to be dead. The neoplasm was the cause of death of six of these.

Malignant Tumors of Tonsil and Pharynx.—New and Childrey report 220 malignant tumors of the palate, oropharynx and tonsil. These malignant neoplasms, which are fairly common, consist principally of squamous cell epitheliomas and are almost five times as common as all the other types of malignant tumors, with the exception of so-called mixed tumors. The squamous cell epitheliomas are principally of an active type and have been miscalled lympho-epitheliomas and transitional cell carcinomas. Sarcomas in the pharynx are principally lymphosarcomas, and these comprised 14.55 per cent of the authors' 220 cases. A few fibrosarcomas were seen and a small group of tumors of various types, including hemangioendothelioma, melano-epithelioma, myeloma and malignant dermoid. The average age of all patients was 54.7 years. Of these, 87.7 per cent were men. The most common situations for malignant pharyngeal tumors are the soft palate and faucial pillars. Except for lymphosarcoma, malignant tumors are rarely primary in the tonsil itself. Extension of the lesions to involve neighboring structures is common, and these include the tonsil, pharynx or hypopharynx, cheek, jaw, alveolus, tongue and floor of the mouth. Metastasis is common; on the patients' admission to the clinic this was apparently present in the cervical lymph nodes in 65 per cent of the cases. Differential diagnosis is important from the prognostic and therapeutic points of view, and the only satisfactory method is by means of microscopic examination of tissue. The prognosis as to length of life, grave in most cases, is better in low grade epithelioma, fibrosarcoma and the few lesions of less active type. The prognosis is affected unfavorably by previous treatment. On 37.7 per cent of the authors' patients, operations had been previously performed elsewhere. Selection of patients for treatment is important; 36.69 per cent of all patients were treated at the clinic. Of the eighty treated patients, twenty-eight (35 per cent) had been operated on elsewhere. Treatment as carried out at the clinic consisted of surgical excision of accessible growths or of destruction of these with cautery or diathermy. Radium in the form of a plaque, in tubes or needles or as radon seeds was used to supplement the foregoing treatment for the primary lesion. The upper deep cervical lymph nodes are removed in all low grade carcinomas of the pharynx and tonsil if the prognosis of the local lesion warrants. The metastasis to the cervical lymph nodes, if from epithelioma graded 4 or from a lymphosarcoma type of growth, is irradiated with radium packs or high voltage roentgen rays, but other metastatic nodes of a less active type of growth are excised; the neck is also irradiated in such cases. Interest in the few cases of miscellaneous malignant neoplasms lies chiefly in their rarity. The results show a surprisingly large number of living patients and of three, five and seven year cures among those who were treated.

Vestibular Response to Rotation.—Ross and his associates found that the duration of nystagmus resulting from rotation was not increased by moderate doses of pilocarpine, nicotine, morphine, camphor, atropine, cocaine, nitrite, sodium bromide, picrotoxin, apomorphine, caffeine or strychnine. The duration of nystagmus resulting from rotation was decreased to a significant amount by a moderate dose of strychnine. The duration of nystagmus resulting from rotation was decreased in possibly significant amounts by sodium bromide, picrotoxin, apomorphine and caffeine. Spinal anesthesia including the body below the neck increased to a marked degree the duration of nystagmus resulting from rotation. The severing of the columns of Goll and Burdach on one side resulted in a difference in the vestibular response of the two sides, that of the side opposite being the greater. The last three observations lead the authors to believe, first, that the spinal cord exerts an inhibitory influence on vestibular reaction; secondly, that this function is located chiefly in the columns of Goll and Burdach, and, thirdly, that the action is exerted after the fibers have crossed.

Adenoidectomy.—Hill calls attention to the fact that while adenoidectomy is a simple procedure it is more difficult to achieve a clean result in that operation than in tonsillectomy. This is due to a tendency to hurry through this part of the combined operation, to the handicap of the bleeding, to dull instruments and to the difficulty of working in a blind space. Visual inspection of the nasopharynx will reveal many tags and remnants and will expedite their removal; it should be employed as a routine measure.

Radical External Operation on Frontal Sinus.—Lillie reports that in the series of 158 consecutive cases in which a radical operation was performed on the frontal sinus, postoperative complication developed in 45. Three deaths occurred, two from meningitis and one from abscess of the brain. The ordinary convalescence of a patient without complication requires seven or eight days in the hospital, and observation afterward for about the same length of time. Complications may or may not affect the ultimate results. The avoidance of complications is, of course, desirable, but there seems to be no way of determining beforehand what complication may follow operation. Thorough removal of diseased tissue is indicated. Whether the Killian operation, or some modification of it, or the Lynch type of operation is employed is determined by the nature of the disease. Skilful technic, careful consideration of the structures involved, and knowledge of the pathologic changes are highly desirable. In general, it may be said that fear of complications need not deter one from operating in cases in which operation is indicated. Good results far outnumber failures.

Archives of Surgery, Chicago

23: 889-1064 (Dec.) 1931

*Fractures of Femur: Treatment by Russell Method of Traction: Twenty-One Cases. H. J. Lund, Oakland, Calif.—p. 889.

Paget's Disease: Predisposing Factor to Osteogenic Sarcoma. B. L. Coley and G. S. Sharp, New York.—p. 918.

*Mechanism of Thrombophlebitic Edema. L. M. Zimmermann and G. de Takáts, Chicago.—p. 937.

*Immediate Contraction of Cutaneous Grafts and Its Cause. J. S. Davis and E. A. Kitlowski, Baltimore.—p. 954.

*Release of Pericardial Adhesions. H. H. Trout, Roanoke, Va.—p. 966.

Rare Congenital Deficiency of Pericardium. J. C. Watt, Toronto.—p. 996.

Metaphen as Disinfectant of Skin. J. A. Kolmer and M. J. Harkins, Philadelphia.—p. 1007.

*Discharge of Bile into Duodenum: Experimental Study. C. B. Puestow, Rochester, Minn.—p. 1013.

*Spontaneous Peptic Ulcers of Duodenum After Continued Loss of Total Pancreatic Juice. R. Elman and A. F. Hartmann, St. Louis.—p. 1030.

Relative Effect of Contraction of Diaphragm on Bronchi of Upper and Lower Lobes. I. A. Bigger, Richmond, Va., and B. Cox, Louisville, Ky.—p. 1041.

Review of Urologic Surgery. A. J. Scholl, Los Angeles; E. S. Judd, Rochester, Minn.; L. D. Keyser, Roanoke, Va.; A. A. Kutzmann, Los Angeles, and A. B. Hepler, Seattle.—p. 1046.

Fractures of Femur.—Lund has used practically all recognized methods of treatment in cases of fracture of the femur. He has obtained the best results by the use of the Russell

traction apparatus. This method depends on a natural and comfortable position of the limb with a minimum of weight whereby the equilibrium of the muscle is restored; with this restoration of muscle tone and position, the fractured ends of the bone will fall into a more or less natural alinement, provided there is no interposed tissue. One must bear in mind that an absolute restoration of anatomic position is not necessary for a good functional result. The author analyzes the results that he has obtained with the Russell traction apparatus and draws the following deductions: 1. The Russell method of traction is the method of choice in treating all types of fractures of the femur from the intertrochanteric to the lower epiphyseal regions. 2. It gives satisfactory position and alinement in all cases, except when muscle is interposed between the fractured ends. 3. It gives a minimum of permanent changes in the joint as compared with other methods. 4. The average period of traction in fractures of the femur is nine weeks, of hospitalization twelve weeks and of temporary disability nine months. 5. The method is inexpensive, easy to apply and comfortable to the patient, and it materially simplifies nursing care.

Thrombophlebitic Edema.—Zimmermann and de Takáts report that ligation of the iliac and femoral veins, alone or in all possible combinations with the contralateral veins, did not produce edema in the lower extremities of dogs. A localized chemical phlebitis and periphlebitis induced with strong irritants, such as 50 per cent sodium salicylate and tincture of iodine, produced a segmental thrombosis but no edema of the limb. Removal of the iliac lymph nodes together with all the retroperitoneal fatty and areolar tissues from the bifurcation of the aorta to Poupart's ligament failed to produce edema of the limb even when the common and internal iliac veins were divided at the same time. In several animals the dissection was repeated to remove any regenerated lymphatics and the collateral veins were ligated, but edema did not develop. From 50 to 70 per cent alcohol injected peripherally into the femoral vein caused extensive venous thrombosis extending into the tributaries and a marked edema lasting from two and a half to three and a half weeks. An emulsion of barium sulphate in gelatin also produced marked edema. Tissue extracts from muscles of the hearts of dogs, the dogs' own serums and finally a concentrated tissue extract, fibrogen, when injected into the femoral vein, caused an extensive venous thrombosis with marked edema. The edema fluid was hemorrhagic and contained comparatively high percentages of protein, indicating injury to the capillary endothelium. If the fibrogen was prevented from forming a clot by the simultaneous injection of heparin, there was no edema. In spite of marked edema, particles of india ink injected into the foot reached the iliac lymph nodes, although delayed by the pressure of the fluid and by the limitation of muscular activity. An obstruction of the peripheral veins over a sufficiently extensive area with a bland, noninflammatory clot produced marked edema, with but little and only secondary involvement of the lymphatics. These results do not confirm the results of recent workers, who emphasize lymphatic obstruction.

Contraction of Cutaneous Grafts.—Davis and Kitlowski state that the only variable factor in cutaneous grafts is the amount of corium with its elastic tissue. In their experience the whole thickness including all the elastic tissue showed the largest amount of shrinkage, which was 43.6 per cent. The half thickness grafts consisting of only a portion of the corium with about half of its elastic tissue showed a shrinkage of 24.86 per cent. The thick Ollier-Thiersch grafts containing only the finest network of elastic tissue of the papillary layer of the corium had a shrinkage of 11.81 per cent. The true Ollier-Thiersch grafts, which contained only the tips of papillae of the corium and no elastic tissue, had a shrinkage that ranged up to 2 per cent, which might well be considered an error of manipulation. If this percentage of error is subtracted from the other three results, the authors feel justified in saying that whole thickness grafts have a shrinkage of 41 per cent, half thickness grafts, 22 per cent, and thick Ollier-Thiersch grafts, 9 per cent, while true Ollier-Thiersch grafts do not have any actual shrinkage.

Pericardial Adhesions.—According to Trout, adherent pericarditis is found in about 4 per cent of routine necropsies. "Acute rheumatic fever" of childhood is the chief etiologic factor, though tubercle bacilli and other organisms are frequently found to be the cause. The condition is far more frequent than it is usually thought to be. Diagnosis is extremely difficult; careful history, physical examination, roentgenograms and electrocardiograms are of great aid. Results of operations justify the plea for more frequent resort to surgical measures in spite of the difficulty of diagnosis. Avulsion of the left phrenic nerve is advocated by the author to supplement the Brauer operation when the trouble is shown to be due to adhesions between the pericardium and the diaphragm. A description of both the Delorme and the Brauer operation is given. A case is reported in which the Delorme operation was done.

Bile Flow into Duodenum.—Puestow describes experiments in which he noted that in the fasting animal with an intact normal gallbladder the orifice of the choledochus was usually closed, the exposed duodenal segment was relatively inactive, and there was almost never flow of bile. The intraductal pressure in the choledochus was found to be from 140 to 170 mm. of bile. The absence of flow of bile was evidently due to a sphincter mechanism at the duodenal end of the choledochus. The tonus of the duodenal musculature apparently was not the sole cause of the sphincter action, and a special sphincter mechanism was suggested. Food stimulated the flow of brown viscid bile. There was usually an initial ooze beginning with the ingestion of food and lasting for from one to three minutes. This was apparently due to psychic or reflex stimulation. A secondary flow began from ten to thirty minutes later and lasted several hours. The bile flowed in brief oozes and spurts, which were frequently related to activity of the exposed duodenum but often occurred independently. Respiration was not a significant factor in the discharge of bile. The exposed segment of bowel became more active and more hyperemic after feeding and reached a maximal degree of peristalsis about half an hour after the ingestion of food. After cholecystectomy, bile continued to flow in the fasting as well as in the nonfasting state. It was lighter in color and less viscid than the bile that flowed after an aminal with an intact normal gallbladder had been fed. Feeding had little effect on the discharge of bile other than to increase the quantity slightly. The orifice of the choledochus was constantly patent. Duodenal activity and its response to feeding were not influenced by cholecystectomy. After removal of the gallbladder, the intraductal pressure in the choledochus of the fasting animal was reduced to from 10 to 20 mm. of bile. Bile salts administered intravenously produced a profuse flow of thin yellow bile. Solutions applied locally to the exposed segment of duodenum occasionally stimulated a slight degree of duodenal activity and rarely were followed by the expulsion of a drop of bile, but generally they did not produce a definite response.

Peptic Ulcers of Duodenum.—Elman and Hartmann observed spontaneous peptic ulcers in six dogs that lost the total pancreatic juice for thirteen or more days and were kept alive and in good condition by careful feeding and the daily intraperitoneal administration of 500 cc. of Ringer's solution. These observations together with those of others point to the importance of the pancreatic juice in protecting the duodenal mucosa, most likely through its control of gastric acidity, by reflux into the stomach. The development of a high gastric acidity in clinical instances of duodenal ulcerations is explained by the diminished reflux of pancreatic juice due to increased pyloric tone. A number of proved cases of duodenal ulcerations were studied, and marked diminution of acid neutralization in the stomach was noted in all. Pylorospasm from whatever cause by diminishing duodenal reflux promotes a high gastric acidity which may be the only factor needed to prevent traumatic, mechanical or other erosions from healing and, indeed, from developing into a peptic ulcer. On the other hand, a pyloric ulcer causes spasm, which in turn promotes hyperacidity leading to a vicious circle and progression of the lesion. Pylorospasm itself is known to develop reflexly from other lesions in the abdomen, thus explaining the not infrequent association of duodenal ulcerations, appendicitis and cholecystitis. Much clinical study has shown that symptoms of pylorospasm and duodenal ulcerations may develop from or be aggravated by

psychic factors presumably mediated through the vagus nerve. The importance of the pylorus in the treatment for duodenal ulcerations thus lies, in part at least, in its effect on the control of gastric acidity. Various operations have been designed, in fact, aiming, by removal of part of the muscle, to prevent pylorospasm. Recently, Morton and Archer called attention to cases of hypertrophy of the pylorus in adults on whom the Rammstedt operation was done with complete cure. Further study may show that this simple procedure may be all that is necessary for the relief of early pylorospasm with or without ulcer.

California and Western Medicine, San Francisco

35: 409-480 (Dec.) 1931

Observations on Bacillus Typhosus in Its Filtrable State. A. I. Kendall, Chicago, and R. R. Rife, San Diego.—p. 409.
Testicular Substance Implantation: Comments on Some 6,000 Implantations. L. L. Stanley, San Quentin.—p. 411.
Fibroids and Ovarian Cysts Complicating Pregnancy. F. W. Lynch, San Francisco.—p. 415.
Surgical Lesions of Bile Ducts and Gallbladder: Certain Principles in Their Treatment. W. Walters, Rochester, Minn.—p. 420.
Cardiospasm. J. H. Shephard, San Jose.—p. 422.
Chronic Empyema: Nontuberculous: Cases. C. D. Lockwood, Pasadena. —p. 424.
Typhoid-Paratyphoid Vaccine in Ocular Inflammations: Cases. H. F. Whalman, Los Angeles.—p. 428.
Medical Military Preparedness. T. W. Bath, Reno, Nev.—p. 431.
Arteriosclerotic Heart Disease: Cases. L. E. Viko, Salt Lake City. —p. 433.
Amebiasis: Comments on Various Amebacides: Case. H. H. Anderson and A. C. Reed, San Francisco.—p. 439.
Chronic Thyroiditis. W. Crane, Oakland.—p 443.
Essays on the History of Embryology: Old Ideas Regarding Sex, Fertilization and Procreation. A. W. Meyer, San Francisco.—p. 447.

Colorado Medicine, Denver

28: 531-606 (Dec.) 1931

Problems in Medical Economics. B. B. Blotz, Rocky Ford.—p. 536.
Medicosocial Aspect of Medical Care for Children. A. H. Washburn, Denver.—p. 540.
Prenatal and Maternal Care. C. B. Ingraham, Denver.—p. 542.

Endocrinology, Los Angeles

15: 473-571 (Nov.-Dec.) 1931

Recent Studies on Chemical Mediations of Nerve Impulses. W. B. Cannon, Boston.—p. 473.
*Endocrine Studies: XXXVI. Level of Ovarian Function During Pregnancy. A. W. Rowe, Boston.—p. 481.
*Some Clinical Results from Use of Adrenocortical Extract as Prepared by Method of Swingle and Pfiffner. J. T. Thompson and R. W. Whitehead, Denver.—p. 495.
*Pancreatitis and Diabetes Mellitus. J. Shirley Sweeney, Dallas, Texas. —p. 508.
Hypophysis, Carbohydrate Metabolism and Diabetes. B. A. Houssay and A. Biasotti, Buenos Aires, Brazil.—p. 511.
Compensatory Hypertrophy of Suprarenal Glands in Rat. H. E. Carlson, Minneapolis.—p. 524.
*Postural Hypotension Occurring in Negro with Addison's Disease. L. B. Duggan and D. P. Barr, St. Louis.—p. 531.
Differentiation of Thyrotoxicosis and Menopausal Disturbances. E. L. Sevringhaus, Madison, Wis.—p. 536.
Syndrome Resembling Familial Periodic Paralysis Occurring in Course of Exophthalmic Goiter. H. F. Dunlap and E. J. Kepler, Rochester, Minn.—p. 541.
Destruction of Depressor Action of Adrenalin by Ultraviolet Radiation. L. Kneer, O. S. Orth, D. J. Verda and W. E. Burge, Urbana, Ill. —p. 547.

Ovarian Function and Pregnancy.—Rowe makes a comparison between a group of cases of ovarian failure, of which 300 were functional and 30 surgical in origin, and a similar group in normal pregnant women, 77 of whom were studied at intervals of two weeks for approximately the last six lunar months of pregnancy. To these were added twenty-three controls. Biometric observations on the blood, urine, respiratory and carbohydrate metabolism are recorded and compared. In addition, a brief survey is made of the correlations of a long series of important clinical observations common to the two conditions. It is concluded that there is a certain amount of evidence which is consistent with, though it does not define, a lowered level of ovarian endocrine activity during gestation. The weight of the objective evidence completely negatives an ovarian overactivity—if, indeed, there is such a condition. The close parallelism in the pictures produced alike by functional ovarian failure with amenorrhea and early pregnancy is striking and urges caution in the establishment of a diagnosis until sufficient time has elapsed to resolve the major question.

Clinical Use of Suprarenocortical Extract.—The suprarenocortical extract used by Thompson and Whitehead was made according to the directions of Swingle and Pfiffner and was tested clinically on seven patients. Three of these patients had Addison's disease; three had pulmonary tuberculosis with varying degrees of hypo-epinephrinemia, and one was suffering from arthritis deformans. Precautions were taken to rule out any possible psychic factor in the clinical observations. Favorable results were obtained with all three cases of Addison's disease. The improvement observed is thought to be the result of treatment. Instances of remission and spontaneous recovery in earlier cases are cited to show that the very nature of the disease is such as to make positive conclusions impossible at present. Experience with tuberculous patients shows that the use of this extract is beneficial in improving the general condition but is possibly hazardous from the standpoint of the infection itself. The greatest danger seems to lie in administering excessive dosage intravenously and in giving the extract to patients with active tuberculosis which may be aggravated thereby. One patient with arthritis did not experience any ill effects from small subcutaneous injections. Pain was relieved in the inflamed joints and mobility was reestablished in some of those that had been immovable. Small subcutaneous injections of the extract are advised at the beginning of treatment. Some patients appear to be intolerant to desiccated whole suprarenal given orally. Greater clinical benefit can at times be obtained by combining cortical administration with other glandular therapy for which the case may indicate a need.

Pancreatitis and Diabetes Mellitus.—Sweeney reports a case of a moderately severe diabetes which developed in an individual who had a strong diabetic background. The diabetes was undoubtedly precipitated by a subacute pancreatitis. Following surgical relief of the associated jaundice, the diabetes disappeared and the patient has what appears to be fairly normal sugar tolerance.

Postural Hypotension and Addison's Disease.—According to Duggan and Barr, extreme postural hypotension may occur in Addison's disease and may increase the asthenia and aggravate the gastric symptoms. Study of a case which they report indicates that changes in position are accompanied by a tachycardia, in which respect the condition seems to differ from that of idiopathic postural hypotension. In this case, also, there was no evidence of the anhidrosis which has distinguished cases of the idiopathic form.

Journal of Comparative Neurology, Philadelphia

53: 389-509 (Dec. 15) 1931

Distribution of Afferent Fibers via Sympathetic Trunks and Gray Communicating Rami to Brachial and Lumbosacral Plexuses. A. Kuntz and D. I. Farnsworth, St. Louis.—p. 389.
Observations on Reflex Activity and Tonicity in Acute Decapitate Preparations, With and Without Ephedrine. J. C. Hinsey, S. W. Ranson and F. R. Zeiss, Chicago.—p. 401.
*Mechanism of Vision: IV. Cerebral Areas Necessary for Pattern Vision in Rat. K. S. Lashley, Chicago.—p. 419.
Changes in Sectional Areas of Largest Fibers in Fifth Lumbar Spinal Nerve and Its Roots in Albino Rat. K. Ide, Philadelphia.—p. 479.
Structure of Cells in Tissues as Revealed by Microdissection: V. Physical Properties of Nerve Cells of Frog (Rana Pipiens). G. S. de Rényi, Philadelphia.—p. 497.

53: 511-570 (Dec. 15) 1931. Supplement

Efficacy of Rat's Motor Cortex in Delayed Alternation. R. B. Loucks, Minneapolis.—p. 511.

Mechanism of Vision.—Lashley destroyed portions of the cerebral cortex, as nearly as possible symmetrical on the two hemispheres, in a number of rats. In a few cases the visual nuclei of the thalamus or the superior colliculi were destroyed. When the animals had recovered from the operation, they were tested for capacity to distinguish the position, distance and pattern of visual objects, with the following results: 1. Interruption of the optic radiations at their point of emergence from the internal capsule abolishes all capacity to react to visual objects, although the ability to distinguish between light and darkness is retained. 2. Destruction of a small area in the lateral part of the area striata of the cortex abolishes the capacity to distinguish between visual patterns but leaves the capacity to distinguish the position and to some extent the distance of visual objects. Two objects differing in size may be distinguished, but only on the basis of their total luminosity. 3. Partial destruction of the optic radiations or partial destruction

of the lateral portions of the striate area leads to some inaccuracy of vision. On the average, acuity is somewhat decreased and the formation of habits based on discrimination of patterns is slowed. There is little indication of a differential fragility of different phases of pattern vision. 4. Lesions in the mesial portions of the striate area, in the supposed visual association area, or in the motor and somesthetic areas do not have any effect on the capacity to distinguish visual patterns or on the rate of formation of the visuomotor habits studied. The formation of visuomotor habits based on the discrimination of rather complex visual patterns probably does not require the establishment of integrations between the striate area and any other specific part of the cerebral cortex.

Journal of Comparative Psychology, Baltimore

12: 357-439 (Dec.) 1931

Effect of Emotional Stimuli on Activity Level of White Rat. J. R. Patrick, Columbus, Ohio.—p. 357.
Relative Potency of Facial Expression and Verbal Description of Stimulus in Judgment of Emotion. Florence L. Goodenough and M. A. Tinker, Minneapolis.—p. 365.
Behavior of White Rats Under Food and Electric Shock Stimulation. K. Dunlap, Evelyn Gentry and T. W. Zeigler, Baltimore.—p. 371.
Proprioceptive Ability of White Rat. W. Dennis, Richmond, Va.—p. 379.
Culdesac Phenomenon. Loh Seng Tsai, Peiping, China.—p. 393.
Studies in Individual Differences in Maze Ability: V. Luminosity and Visual Acuity as Systematic Causes of Individual Differences, and an Hypothesis of Maze Ability. R. C. Tryon, San Francisco.—p. 401.
Relation to Hunger and Activity Drives of Factor of Habituation to Maze. Margaret F. Washburn, E. L. Collens and E. Upjohn.—p. 421.
Block Elevated Maze for Rats. W. Dennis, Richmond, Va.—p. 429.

Journal of Infectious Diseases, Chicago

49: 455-540 (Dec.) 1931

*Variation of a Bacillus Coli-Like Organism. W. J. Nungester and S. A. Anderson, Chicago.—p. 455.
Metabolism of Protozoa: II. New Solid and New Liquid Medium for Cultivation of Leishmania Donovani. A. J. Salle, Berkeley, Calif.—p. 473.
Id.: III. Metabolism of Leishmania Donovani. A. J. Salle, Berkeley, Calif.—p. 481.
*Lethal Temperatures for Porcine Strains of Brucella Abortus: Especial Reference to Pasteurization. Ruth A. Boak and C. M. Carpenter, Rochester, N. Y.—p. 485.
*Bacteriology of Blood in Chronic Infectious Arthritis. H. Bernhardt and P. S. Hench, Rochester, Minn.—p. 489.
Distribution of Acid-Fast Bacteria in Soils. C. A. Frey and W. A. Hagan, Ithaca, N. Y.—p. 497.
Herpetic Virus in Mice: Pathogenicity, Immunity and Susceptibility of Host. H. B. Andervont, Boston.—p. 507.
*Interstitial Peripheral Neuritis in Experimental Poliomyelitis: Notes on Nature of First Pathologic Changes in Spinal Cord. A. Jordi, San Francisco.—p. 530.

Bacillus Coli-Like Organism.—Nungester and Anderson describe a series of variants which were produced from a Bacillus coli-like organism isolated from a case of empyema of the gallbladder. These variants differed in form of colony, with colonial structures of the R, S and intermediate types. A mucoid form of colony is also described. Marked difference in the ability of the variants to ferment lactose is noted when such studies are carried out on solid mediums containing lactose and an indicator. This difference is not noted when the tests are carried out in liquid mediums, because the conditions of liquid mediums favor reversion to the lactose-fermenting type. There is no absolute correlation between the form of the colony and the ability to ferment lactose. All variants, except the mucoid, are agglutinated in a high dilution of the agglutinating serum prepared against the parent form. The failure of the mucoid variant to be agglutinated may be attributed to the physical condition of the bacterial suspension. "Reverted" forms of the mucoid variant were agglutinated in a high dilution of the immune serum prepared against the parent form. Change from the lactose-fermenting to the non-lactose-fermenting forms is effected with difficulty. The reverse change is readily brought about. The influence of various conditions of growth on the latter change, such as a solid medium, the hydrogen ion concentration of the medium, the presence of lactose, dextrose or plain broth and irradiation of the organisms, is reported.

Porcine Strains of Brucella Abortus.—Boak and Carpenter report experiments that they performed to determine whether the temperature-time factor more or less universally used for the pasteurization of milk is satisfactory for destroying the most pathogenic strains of Brucella abortus. On the basis of their observations they conclude that the present requirements for the pasteurization of milk (heating at from 142 to 145 F. for from twenty to thirty minutes) are adequate for destroying the most virulent strains of Brucella abortus.

Blood in Infectious Arthritis.—Bernhardt and Hench made eighty blood cultures from twenty patients with chronic infectious arthritis. Although three different methods of cultivation were used (one of them being that published by Cecil, Nicholls and Stainsby) streptococci were not found in any culture. The authors do not consider the results in their series or in the cases covered by their survey as conclusive arguments for or against the theory that the type of chronic arthritis studied is infectious in origin. Although they are inclined to accept the theory that infection is of significance, it is apparent that, with present cultural methods, it is extremely difficult to isolate organisms from the blood of patients suffering from the condition studied, with any uniformity or with any great frequency.

Interstitial Peripheral Neuritis in Experimental Poliomyelitis.—Jordi states that the peripheral nerves in seventeen of twenty monkeys that were infected experimentally by intracerebral and intranasal methods showed a definite interstitial inflammation. The perivascular infiltrations, mostly by round cells, were generally small and inconspicuous and were not numerous. Infiltrations were found as early as twelve hours after the onset of the paralysis. However, in the three animals the nerves of which were free from infiltrations and in a few animals in which not all the extremities were affected, paralysis had existed for less than six days. Infiltrations were present in the nerves of extremities that were not paralyzed. The sciatic nerves of one normal monkey, which were partly cut twelve and four days, respectively, before the animal was killed, showed secondary degeneration but no signs of interstitial inflammation, thus proving that the interstitial neuritis in experimental poliomyelitis is caused by the specific virus. In early stages of poliomyelitis, necrosis of the ganglion cells, both in the spinal cord and in the intervertebral ganglion cells, and not the interstitial inflammation, is the first manifestation of the virus.

Journal of Nervous and Mental Disease, New York

75: 1-112 (Jan.) 1932

Report of Case of Patient Who Considers Himself an Hermaphrodite. I. L. Polozker, Detroit.—p. 1.
Acid-Base Equilibrium of Blood in Psychotic Patients: Especial Reference to Affective Psychoses. K. E. Appel, C. B. Farr and P. J. Hodes, Philadelphia.—p. 22.
Simple Time Key for Chronaxia. J. van de Erve and J. M. van de Erve, Charleston, S. C.—p. 34.
Meaning of the Dream. L. S. London, New York.—p. 40.

Journal of Pharmacology & Exper. Therap., Baltimore

43: 607-721 (Dec.) 1931

Magnesium Absorption in Dogs and Its Effect on Metabolism of Calcium. H. G. Barbour and J. E. Winter, Louisville, Ky.—p. 607.
*Some Factors Influencing Stability of Fluidextract of Ergot. M. I. Smith and E. F. Stohlman, Washington, D. C.—p. 621.
*"Avertin" Anesthesia in Experimental Nephritis. J. R. Veal, J. R. Phillips and C. Brooks, New Orleans.—p. 637.
*Importance of a Standard of Reference in Toxicity Determinations of Mercurochrome. J. H. Burn and G. D. Greville, London, England.—p. 645.
Responses of Excised Batrachian Alimentary Canal to Autonomic Drugs: I. Xenopus Laevis (South African Clawed Toad)—Pilocarpine, Physostigmine, Adrenalin. D. Epstein, Cape Town, South Africa.—p. 653.
Bulbocapnine Catalepsy and Grasp Reflex. C. P. Richter and A. S. Paterson, Baltimore.—p. 677.
Comparison of Rat and Mouse Units in Assay of Female Sex Hormone. T. J. Becker, C. H. Mellish, F. E. D'Amour and R. G. Gustavson, Denver.—p. 693.
Tolerance of Toad Toward Strophanthin. D. Epstein, Cape Town, South Africa.—p. 697.

Stability of Fluidextract of Ergot.—Smith and Stohlman present the results of a study of some of the factors influencing the stability of the fluidextract of ergot. They noted that storage at elevated temperatures was a potent factor in bringing about deterioration of the physiologically active alkaloids of ergot. Conversely, storage at icebox temperature seems to insure stability for at least eight months. Incubation at 50 C. for fifteen days causes pronounced deterioration of the fluidextract of ergot. The addition of oxidizing substances under these conditions markedly accelerates, while reducing substances considerably retard the rate of deterioration of the physiologically active alkaloids. The authors' observations indicate that

decreasing the p_H of the fluidextract of ergot by varying it within the limits of from 5.2 to 2.2 does not favor its stability. Parallel assays by the colorimetric and Broom and Clark methods applied to a series of fluidextracts of ergot subjected to a wide range of deterioration gave no results indicating a degree of discrepancy greater than that which could be accounted for by the combined probable errors of the two methods.

"Avertin" Anesthesia in Experimental Nephritis.—From their observations on normal and nephritic rabbits, Veal and his associates conclude that "avertin" is contraindicated as a general anesthetic in cases of renal disease. Only in those cases in which the kidney function has been found to be normal should it be used as a general anesthetic. The danger of using "avertin" in cases presenting renal damage lies in the fact that the fatal dose closely approaches the anesthetic dose in such cases, leaving no adequate margin of safety between surgical anesthesia and death.

Toxicity Determinations of Mercurochrome-220 Soluble.—Burn and Greville report that the determination of the toxicity of a sample of mercurochrome-220 soluble by intravenous injection into mice and calculation of the average lethal dose gave a different result in one laboratory from that in another, although the details of technic were the same. Examination of four samples in each of two laboratories showed that there was a constant difference between the results obtained. The average lethal dose in one laboratory was regularly from 1.60 to 1.69 times greater than that in the other. This is a large difference to occur between two laboratories in a simple toxicity determination. It follows that the figure for the toxicity of a particular sample of mercurochrome-220 soluble holds good only for the conditions in which the figure is determined, and that in order to obtain figures that are generally applicable, the toxicity of an unknown sample must be stated in terms of some sample arbitrarily selected as a standard of reference.

Journal of Preventive Medicine, Chicago

5: 413-494 (Nov.) 1931

*Persistence of Yellow Fever Immunity. W. A. Sawyer, New York. —p. 413.
*Production of Artificial Immunity in Albino Rat to Metazoan Parasite. H. M. Miller, Jr., St. Louis.—p. 429.
Immunity of Albino Rat to Superinfestation with Cysticercus Fasciolaris. H. M. Miller, Jr., St. Louis.—p. 453.
Milk-Borne Epidemic of Typhoid Fever in Salisbury, Maryland. S. H. Hurdle, Salisbury, Md.—p. 465.
*Poliomyelitis in Adults: Sixty Cases. Margaret A. Limper, Huldah E. Thelander and E. B. Shaw, San Francisco.—p. 475.

Persistence of Yellow Fever Immunity.—Sixty serums from persons who had had a disease diagnosed as yellow fever from thirty to seventy years previously were tested by Sawyer for their power to protect monkeys against yellow fever virus; forty-five proved to have this protective power. Five of six serums from persons who had had yellow fever seventy-five years before the specimens were obtained protected monkeys, as did also one specimen taken seventy-eight years after the attack. The immunity from yellow fever ordinarily lasts for life and can be demonstrated by protection tests with the patient's serum, using rhesus monkeys or white mice. The persistence of immunity acquired through an attack of yellow fever is not dependent on any subsequent exposure to the bites of infected mosquitoes. There is evidence suggesting that the concentration of antibodies in the serum may in some cases gradually diminish until the antibodies are no longer demonstrable by protection tests with ordinary amounts of the serum; but it does not follow that in such cases the person becomes again infectible.

Artificial Immunity in Albino Rat.—Miller produced artificially an active acquired immunity to a metazoan parasite, Cysticercus fasciolaris, in the albino rat by periodic injections of fresh or powdered worm material. This is the first report of artificial immunity to a cestode parasite and is one of the few instances of artificially produced immunity to a metazoan parasite. In all but a few exceptional cases the cysts developed normally in the control animals and were completely or almost completely inhibited from growing in the immunized animals. Fresh or powdered worm material, usually injected intraperitoneally, was equally effective in producing immunity. The animal used in these experiments, the rat, is a natural host for the parasite.

Poliomyelitis in Adults.—Limper and her associates report that of 268 poliomyelitis cases in San Francisco in the 1930 epidemic 72 (26.8 per cent) were in persons over 16 years of age. A study was made of the case histories of 60 of these adults. Of the 60, only one was over 40 years old and 34 were between 16 and 25 years of age; 33 were males and 27 females. In course, sequelae and mortality rate (27 per cent) the disease was more severe in these adults than in the children affected in the same epidemic. The deaths among adults accounted for 70 per cent of the total epidemic mortality. Serum therapy seemed far less encouraging in the adults than in children, perhaps because of the later diagnosis in the adult cases.

Journal of Thoracic Surgery, St. Louis

1: 113-224 (Dec.) 1931

*Stab Wound of Heart: Electrocardiographic Studies of Two Cases. D. C. Elkin and H. S. Phillips, Atlanta, Ga.—p. 113.
Pneumocardiac Tamponade: Study of Effects of Atmospheric Pressure, Negative Pressure and Positive Pressure on Heart. C. S. Beck and Leabelle Isaac, Cleveland.—p. 124.
Decompression of Heart: Case. W. A. Hudson, Detroit.—p. 149.
Bronchiectasis. H. Ballon, J. J. Singer and E. A. Graham, St. Louis. —p. 154.
Bronchial Stenosis. L. Eloesser, San Francisco.—p. 194.

Stab Wound of Heart.—Elkin and Phillips report two cases of successful suture of stab wound of the heart. In one patient the wound was in the right ventricle with severance of the descending branch of the left coronary artery. In the other the wound was in the left ventricle and the coronary artery was uninjured. The electrocardiographic observations in both cases were similar to those seen in clinical occlusion of the coronary arteries. In the patient with ligation of the coronary artery, electrocardiographic changes did not appear until thirty-six hours after injury, a fact of clinical importance in differentiating between coronary occlusion and abdominal disease.

Kansas Medical Society Journal, Topeka

32: 399-432 (Dec.) 1931

Tribromethyl Alcohol ("Avertin") as Rectal Anesthetic. L. W. Angle, Kansas City.—p. 399.
Present Status of Urinary Antiseptics. A. D. Gray, Topeka.—p. 402.
Epidemic Cerebrospinal Meningitis. L. W. Shannon, Hiawatha.—p. 405.
Tularemia (Deer Fly Fever; Rabbit Fever). W. A. Hayward, Coffeyville.—p. 407.
Ocular Causes of Headaches. E. J. Mullen, Kansas City.—p. 411.

Laryngoscope, St. Louis

41: 797-860 (Dec.) 1931

Mastoiditis Complicated by Unusual Neurologic Manifestations: Case for Diagnosis. J. M. Polisar, Brooklyn.—p. 797.
*Residual Hearing After Radical Mastoidectomy. J. J. Pressman, Los Angeles.—p. 808.
Bilateral Labyrinthine Hemorrhage in Case of Aplastic Anemia. M. Rosenbluth, Bronx, N. Y.—p. 821.
Fatal Case of Pharyngeal Hemorrhage. A. Kaufman, Boston.—p. 826.
Diagnosis and Conservative Treatment of Sphenoid Suppuration. W. A. Wagner, New Orleans.—p. 829.
Acute Abscess in Body of Sphenoid, Ruptured into Pituitary Fossa: Necropsy Report. A. L. Grant, Jr., Auburn, Maine.—p. 842.
An Unusual Form of Acute Frontal Sinusitis. I. R. Smith, Toronto. —p. 845.
Bronchoscopic and Esophagoscopic Diathermy Electrodes. M. C. Myerson, New York.—p. 849.
*Relations of Dental Infections to Maxillary Sinus Disease. V. R. Alfaro, Washington, D. C.—p. 850.
An Aural Protector Against Noise and Water. A. C. Jacobson, Brooklyn.—p. 857

Residual Hearing.—Pressman states that, theoretically, the radical mastoid operation should not be detrimental to hearing. In 372 cases of radical mastoidectomy gathered from the literature, 35 per cent of the patients presented improved hearing, 45 per cent further loss of hearing, and 17 per cent no change. Several cases from the literature are described in which radical mastoidectomy resulted in an improvement of hearing amounting to at least 45 sensation units. Four cases are presented, each with bilateral otitis media and of similar duration on the two sides. One ear in each case was treated conservatively and the other by radical mastoidectomy. The poorer hearing ear was selected for operation. The end-result so far as hearing was concerned revealed that in three cases there was no great difference in hearing between one ear and the other. The fourth case, four months convalescent, presented a greater loss in the ear on which operation had been performed, but this

relationship existed prior to operation, and no further loss in hearing followed the radical mastoidectomy. Four additional cases are presented, and the hearing level is compared before and after operation. Two of these four cases presented additional loss of hearing after operation, one shows definite improvement, and in the fourth there is no considerable change in either direction. Two similar groups, each of twelve consecutive cases of chronic suppurative otitis media, are compared so far as hearing is concerned. One group had been treated conservatively and the other by radical mastoidectomy. The nonoperative group presented slightly better hearing, but it is pointed out that patients selected for radical mastoidectomy usually suffer a greater hearing loss prior to treatment than those who are treated conservatively. The difference in hearing level is, at any rate, very slight.

Relations of Dental Infections to Maxillary Sinus Disease.—Alfaro believes that many infections of the maxillary sinus are due to frank or to hidden dental disease or to unavoidable dental trauma. A careful transillumination of all the teeth should be a routine procedure with every rhinologist, supplemented by a dental examination in suspicious cases. A careful examination by the dentist should be advised in all cases of maxillary sinusitis that do not respond to treatment in a reasonable length of time. The radical surgical treatment of chronic antrodental pathologic changes should be performed by the dental surgeon and the rhinologist together. A close cooperation at all times with the dental surgeon will decidedly reduce the percentage of failures.

New Jersey Medical Society Journal, Orange

28: 795-898 (Nov.) 1931

*Surgical Aspects of Biliary Tract Disease. J. B. Deaver, Philadelphia.—p. 795.
Value of Duodenal Tube Drainage of Biliary System in Treatment of Various Diseases and Disorders of Liver. B. B. V. Lyon, Philadelphia.—p. 799.
*New Method of Outlining the Heart, Its Chambers and Great Vessels. C. M. Fish, Atlantic City.—p. 817.
Uterine Hemorrhages Radiologically Considered. W. G. Herrman, Asbury Park.—p. 819.
Cardiac Failure of Congestive Type. C. E. Teeter, Newark.—p. 823.
Radiographic Diagnosis of Gallbladder Pathology. L. J. Gelber, Newark.—p. 829.
Myocardosis; the Failing Heart of Middle Life: Further Observations. A. E. Parsonnet, Newark, and A. S. Hyman, New York.—p. 831.
Fusospirochetal Disease of Lung. F. J. Altschul, Long Branch; C. A. Pons and W. G. Herrman, Asbury Park.—p. 834.
Clinical Evaluation of Concentrate of Vitamins A and D. J. H. Marcus, Atlantic City.—p. 850.
Looking at Facts in High Cost of Medical Care. E. Reissman, Newark.—p. 854.

Surgical Aspects of Biliary Tract Disease.—Deaver states that, among the serious possibilities of gallbladder disease, cholangeitis assumes importance because of its tenacious chronicity, a tenacity which is explained by the fact that the lesion of cholangeitis resides deep in the wall of the bile ducts. The symptoms of cholangeitis are those of infection plus certain features related to hepatic function. The mild case presents fever, malaise, anorexia, jaundice at times, and usually an appreciable enlargement of the liver—the same train of symptoms, in fact, as is seen in catarrhal jaundice, stone in the common duct, and hepatitis, so that differentiation is not always possible. Indications for operation depend on the surgeon's experience in estimating the patient's condition, and the degree of disability suffered by the patient. Some mild cases of cholangeitis may subside spontaneously. A similar acute judgment is required in the more severe cases which are characterized by septic temperature, deep jaundice, profuse sweats, anorexia, nausea, vomiting and marked enlargement of the liver. In these, the margin of safe surgery is easily overstepped. The physician acts best who seeks a surgical opinion early in the early case. The infection being interstitial, cure can be obtained only by continuous, prolonged drainage, such as can be obtained only by means of a T-tube in the common duct. The logic of the treatment is the same as that which applies to localized infection elsewhere in the body by the relief of tension and drainage, but with this difference, that such localized infections are usually acute conditions, whereas most of the lesions of the biliary tract are a chronic, low-grade and well established infection which has led to more or less functional derangement. Simple drainage of the gallbladder will not suffice for a cure in these cases. The gallbladder must be removed because the potential power for future trouble lies in the infection retained within its walls. So, removal of the gallbladder and T-tube drainage of the common duct will be required, according to presenting conditions. This applies likewise to involvement of the common duct and to pancreatitis. The author rarely used biliary drainage by cholecystogastrostomy or cholecystoduodenostomy, not only because he considered external drainage more effective but also because the stoma of either type of anastomosis does not remain patent for any length of time if the common duct is not permanently obstructed. Furthermore, the presence of the anastomotic opening may actually favor an ascending infection for the stomach or duodenum into the gallbladder and the upper biliary tract.

New Method of Outlining the Heart, Its Chambers and Great Vessels.—In outlining the borders of the heart, cardiac chambers and great vessels, Fish uses the Ford stethoscope and has found that more accurate results are obtained in outlining the more superficial structures by substituting a piece of rubber tubing for the bell of the stethoscope. The bell of the stethoscope is first placed just below the tip of the xiphoid process and to the right of the midline (point 1). Then, beginning on the lower thoracic wall and percussing from the sides toward the sternum, using a gentle percussion stroke, one hears a definite increase in volume of sound when the percussing finger reaches a point that corresponds to the surface markings of the inferior vena cava. The course of this vessel can be followed to a point beneath the right border of the sternum at the level of the third interspace, at which point the vena cava enters the right auricle. Then, substituting a piece of one-fourth inch rubber tubing for the bell of the stethoscope, and placing the tubing at point 2 (the right border of the sternum at the level of the third interspace), and using a very gentle percussion stroke, one can percuss out two areas that correspond to the right auricle and right ventricle. Owing to greater depth of the ventricle, it is necessary to use a somewhat heavier stroke when one percusses its borders. When the percussion stroke is properly gaged, a very definite increase in the volume of sound is heard as the borders of the cardiac chambers are reached. The tubing of the stethoscope is again substituted for the bell and moved to point 3 (the third interspace just to the left of the sternum). From this point, by the same method used in outlining the borders of the right auricle and ventricle, one can outline the left auricle and ventricle, keeping in mind the fact that a heavier percussion stroke is necessary in outlining a deeper structure than a more superficial one. Without changing the point of contact for the stethoscope, but using the bell instead of the tubing, one may outline the ascending, transverse and descending rami of the arch of the aorta. If the stethoscope bell is then placed at point 4 (below the xiphoid process and just to the left of the midline), the descending aorta may be traced from below upward; and this is found to coincide accurately with the descending limb of the arch as determined from point 3. As that point overlies the interventricular septum, the outer borders of the heart can be outlined by the same technic. The cardiac chambers previously outlined are found to lie within these borders.

Philippine Islands M. Assn. Journal, Manila

11: 425-456 (Nov.) 1931

Prepsychotic Manifestations in Dementia Praecox (Schizophrenia). E. Domingo.—p. 425.
Treatment with Malaria of General Paralysis of Insane. C. de Asis.—p. 429.
Manganese Chloride in Treatment of Functional Mental Diseases. J. A. Fernandez.—p. 432.
Rupture of Placenta: Case. S. Y. Orosa, S. Ochoa and J. Varela.—p. 436.
Pulmonary Suppuration and its Treatment. S. U. Estrada.—p. 438.

Public Health Reports, Washington, D. C.

46: 3023-3101 (Dec. 18) 1931

Scarlet-Fever Streptococcus Antitoxin in Treatment of Scarlet Fever. M. V. Veldee, F. E. Stevenson and A. G. Mitchell.—p. 3023.

Rhode Island Medical Journal, Providence

14: 187-200 (Dec.) 1931

Modern Aspects of Hypertension. C. B. Leech, Providence.—p. 187.
Case of Double Vagina, Uterus and Bladder. R. C. Bates, Providence.—p. 192.

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FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

28: 263-340 (Oct.-Dec.) 1931

Experimental Scarlet Fever by Means of Scarlatinal Hemolytic Streptococcus. T. Toyoda, Y. Futagi and M. Okamoto.—p. 263.
*Purpura as Complication of Scarlet Fever. F. G. Wood-Smith.—p. 273.
*Hair Eating and Pica in Children. Jean Smith.—p. 282.
Dwarfism with Stippled Epiphyses. W. G. Sears.—p. 290.
Helminths as Cause of Meningitis. L. J. M. Laurent.—p. 296.

Purpura as Complication of Scarlet Fever.—According to Wood-Smith, purpura is a rare complication of scarlet fever. In the cases to which he has been able to refer in the medical literature, the two sexes appear to be equally affected. Children are more commonly affected than adults. The purpura is most probably due to capillary damage caused by the toxin of the streptococcus responsible for scarlet fever. Purpura may occur during the course of any type of scarlet fever, whether mild or severe. The most common time for the purpura to make its appearance is during the third week of the infection. The platelet count, although often decreased, may be normal. All forms of purpura described are manifestations of the same condition in varying degrees of severity. The death rate is high, and in the fulminant type death may occur in forty-eight hours or sooner.

Hair Eating and Pica in Children.—Smith points out that heretofore the treatment of most cases of hair ball which have been diagnosed during life has been surgical. The ileocecal valve presents much greater difficulty to the passage of the foreign body than does the pylorus. In a case reported by the author, the pain and distention did not appear until the mass reached the ileocecal valve. Roentgen examination, in that by this means it may be possible to ascertain the density, size and number of hair balls present in the stomach, is of assistance both in the diagnosis of this condition and in directing treatment. If a foreign body fills the stomach, the only course is obviously to operate. If, however, several smaller balls are present, expectant treatment may be adopted provided surgical help is always available should acute obstruction supervene.

British Medical Journal, London

2: 1121-1164 (Dec. 19) 1931

Murphy, and Some Principles of Urinary Surgery. A. H. Burgess.—p. 1121.
*Shock Following Blood Extravasation, with Especial Reference to Treatment of Accidental Hemorrhage. O. Browne.—p. 1124.
*Nasal Element in Spasmodic Asthma. J. Dundas-Grant.—p. 1127.
*Survey of Probable Prognostic Factors in Treatment of General Paralysis. W. A. Caldwell.—p. 1129.
*Treatment of True Rheumatoid Arthritis by Blood Transfusion and Insulin. W. S. C. Copeman.—p. 1130.
Rational Dosage of Diphtheria Antitoxin. E. Grundy.—p. 1132.

Shock Following Blood Extravasation.—Browne emphasizes the fact that shock can follow blood extravasation, but this is not inevitable. The first step in the production of shock is a fall in blood pressure, and accordingly as the blood pressure falls to lower levels pulse rate and urinary changes become evident. A persistently falling blood pressure, in spite of prophylactic treatment, is of serious import, and efforts should be made in the presence of such readings to localize and remove the blood effusion. Prophylactic treatment is of the utmost importance. By its use otherwise inoperable cases will be rendered safe for operation. In the event of labor not starting after puncture of the membranes, and so forth, plugging the vagina should be performed without delay, provided the blood pressure is approximately 80 mm. of mercury. Below this level, unless marked improvement in the patient is soon noted, classic cesarean section should be performed.

Nasal Element in Spasmodic Asthma.—According to Dundas-Grant, it is obvious that asthma depends on many disease conditions and is in a way rather a symptom than a disease in itself. This may not afford much immediate consolation to the sufferer but it indicates to the practitioner that it must be analyzed and attacked from various sides. If on one side there is failure, an attack may be hopefully made on another, if undue delay is avoided. On the strength of the results he has produced, he urges writers on asthma in textbooks of medicine to place among their foremost instructions that the nasal condition should be thoroughly investigated and judiciously dealt with.

Prognostic Factors in Dementia Paralytica.—Caldwell states that in dementia paralytica pregnancy doubles the chances of remission. Patients below the age of 40 years make the most economically satisfactory remission, although this should not prevent every patient whose physical state will stand it from receiving treatment quite irrespective of age. In England, expansive and manic patients with dementia paralytica give the best prognosis, while depressed and juvenile cases do not respond satisfactorily to treatment. The ability to remember the primary infection and its treatment is of prognostic value, although neither the length of time elapsing before the onset of neurosyphilis nor the pathologic observations are of any value in this respect. Treatment must be thorough and should be supported by a subsidiary course of an organic arsenic compound after the fever.

Rheumatoid Arthritis.—Copeman believes that the best method of dealing with a case of rheumatoid arthritis which fails to respond to ordinary measures is by a combination of blood transfusion and insulin. No harm will result, and in most cases considerable benefit may be expected. The complete procedure is as follows: 1. Search is made for a toxic focus; if one is found, appropriate treatment is given (the bowel should not be forgotten as a "focus"). 2. If this produces no improvement, one should estimate (*a*) the blood sedimentation rate, to see whether a hidden focus of infection is probable, and (*b*) the sugar tolerance curve, in view of future treatment with insulin. 3. The patient is placed in bed, and two blood transfusions of 500 cc. each are given at an interval of eight days, with intensive physical treatment after each. With nervous patients it is often best to refer to the procedure as a blood "injection," rather than as a "transfusion." 4. The patient should be made to get up on the ninth day. It is important to do this (if she is fit enough) before the psychologic effect of the procedure has worn off, particularly with a patient who is almost resigned to being bedridden, as is so often the case. The patient must be keen to help, and her cooperation and interest must be sought if the best results are to be obtained. 5. The patient is put on an insulin regimen and made to weigh herself every day and chart her weight as a curve to stimulate her interest in the method. Most patients will gain about 1 pound in the first week, and after that from 1 to 2 pounds a week in favorable cases. If the patient has been losing weight prior to the institution of this method, a "latent period" of from seven to ten days must be expected before any gain in weight is made. The patient must be cautioned against the expectation of any "miraculous" result but should be told to expect and report gradual improvement in her general and local condition and weight, the effect on the general health and mental outlook generally being the initial signs of permanent improvement.

Lancet, London

2: 1335-1390 (Dec. 19) 1931

*Gastrojejunocolic Fistula, with Megalocytic Anemia Simulating Sprue. N. H. Fairley and T. P. Kilner.—p. 1335.
*Protein in Asthma. T. Nelson and A. D. Porter.—p. 1342.
*Variations in Antigen Content of Serum in Disease. A. Q. Wells.—p. 1348.

Gastrojejunocolic Fistula.—Fairley and Kilner report three cases of gastrojejunocolic fistulas presenting a clinical picture simulating sprue. All presented an anemia of megalocytic type. Two were associated with high secretion of hydrochloric acid, and both responded temporarily to liver extract in adequate dosage. Analysis of the feces showed a high fecal fat with adequate splitting. Chemical examination of the blood revealed a lowered total calcium associated with a normal inorganic phosphorus and a low serum bilirubin content. The rôle of malabsorption in a short-circuited small intestine, and the absence of Castle's stimulating factor in the production of the anemia, are discussed.

Protein in Asthma.—According to Nelson and Porter, a small weekly hypodermic dose of simple animal protein in high dilution is an effective agent in preventing allergic spasm. It

is difficult to prolong the action of the protein except in mild cases. The authors agree with van Leeuwen that, while skin tests often reveal the allergic condition, they are not of therapeutic value.

Variations in Antigen Content of Serum in Disease.—When Wells titrated the serums from various animals and from man against the appropriate antiserums, he noted that the antigen content of each species was constant. Antiserums against any one serum do not always contain the same antibody. The author suggests that two antihuman serums contained, in one case antialbumin bodies, and in the other antiglobulin bodies. The serum from some nephritic patients differed markedly from normal human serums in their antigen content. The antigen content and the total protein content in the serum of a horse after severe bleeding showed remarkable agreement.

2: 1391-1442 (Dec. 26) 1931

*Abdominal Discomfort. A. E. Russell.—p. 1391.
*Vitamin B in Anemia. S. Davidson.—p. 1395.
*Tonsillectomy, Schick Immunity, and Diphtheria Carriers. S. F. Dudley. —p. 1398.
*Diphtheria Immunity and Tonsillectomy. A. H. G. Burton and A. R. Balmain.—p. 1401.
Treatment of Vesical Papillomas. J. B. MacAlpine.—p. 1403.
Amebiasis in Temperate Zone: Seven Cases. I. MacDonald.—p. 1404.
Deep Broth Cultures of B C G. A. Saenz.—p. 1406.

Abdominal Discomfort.—Russell calls attention to the fact that painful as are many of the disturbances within the abdomen it is a matter for surprise how painless are many of the grossest of them. Ascites, for instance, may be and usually is painless, even in extreme degree, though it will give rise to discomfort often described as a sensation of tightness. In fact, its important symptoms are often situated in remoter regions—dyspnea and cardiac embarrassment, for instance, from pushing upward of the diaphragm. But the more rapid the development of fluid the more likely is pain to be present, and any exudation associated with acute peritoneal inflammation gives rise to severe pain. Tuberculous peritonitis in its acute forms or in the localized suppurative variety may be accompanied by severe pain but is sometimes so painless that its presence is ascertained only through the increasing size of the abdomen or during the routine examination of a patient complaining of general signs of ill health. The mere enlargement of an abdominal organ need not cause pain. An enlarged spleen is usually painless, and even an enormous enlargement may cause nothing more than discomfort or a sensation of weight. How little this discomfort may be is shown by the fact that it is very unusual for a patient suffering from myelemia to consult a physician for abdominal discomfort or pain until his spleen has attained a great size, and it is quite common in those cases in which the patient seeks advice for the general symptoms such as anemia or weakness for a great enlargement of the spleen to be discovered which has produced no symptoms whatever. It is quite a different matter, however, when a patch of local peritonitis develops on the surface of the spleen after an infarction, for instance. Similarly, great enlargement of the liver may cause nothing more than a sensation of weight, but one factor that certainly influences sensation is the rapidity with which the enlargement takes place. A liver that has enlarged rapidly from passive distention with blood in cardiac failure or with bile in obstruction of the biliary passages is much more tender than a liver that has enlarged slowly. Malignant growths may give rise to little pain, and cancer of the liver and even of the stomach may proceed to an almost painless end. No one would belittle the pain of cancer, above all of external parts, but internal growths are sometimes very benign as regards pain and produce little more than discomfort.

Vitamin B in Anemia.—Davidson treated a series of cases of primary and secondary anemia with large doses of vitamin B. The evidence produced was definitely against vitamin B being the antianemic factor contained in liver or liver extract. The author discusses the possible value of vitamin B during the remission stage.

Tonsillectomy, Schick Immunity, and Diphtheria Carriers.—Dudley reports that in a semi-isolated community the total carrier rate for diphtheria bacilli among boys who had been operated on for tonsils and adenoids was half that in a control group. There was, however, no significant difference in the carrier rate for toxigenic diphtheria bacilli; tonsillectomy had apparently only lowered the incidence of avirulent infections. The frequency of positive Schick reactions was twice as great in the control as in the tonsillectomized group. Boys in the Schick susceptible subgroup in which the tonsils had been removed were more easily immunized artificially than boys in other Schick susceptible groups. Evidence is brought forward in favor of the view that tonsillectomy does not, in itself, stimulate the production of diphtheria antitoxin but in some way accelerates latent immunization by the diphtheria bacilli of the environment.

Diphtheria Immunity and Tonsillectomy.—Burton and Balmain made an investigation of 682 children who had been Schick tested in relation to the effect of previous tonsillectomy on diphtheria immunity; 27.6 per cent (190 children) had had previous tonsillectomy. They review the relationship of the following factors to the Schick test and previous tonsillectomy: age, proportion of children Schick positive and Schick negative, artificial immunization and family grouping. The results of the inquiry justify the conclusion that previous tonsillectomy has no influence on the production of immunity to diphtheria in children living in a residential nonrural, noncongested area.

Medical Journal of Australia, Sydney

2: 703-734 (Dec. 5) 1931

Scarlatina. F. V. G. Scholes.—p. 703.
Insects in Their Relationship to Injury and Disease in Man in Australia. J. B. Cleland.—p. 711.
Study of Bacteriophage in Relation to Infantile Bacillary Dysentery. F. M. Burnet, Margot McKie and I. J. Wood.—p. 714.
*Brill's Disease or Pseudotyphus. W. S. McGillivray.—p. 716.
Treatment of Myoma of Uterus. R. Worrall.—p. 719.

2: 735-766 (Dec. 12) 1931

Some Voyages Connected with Discovery of Australia: Their Medical History. E. S. Jackson.—p. 735.
Observations on the Certainly Lethal Dose of Venom of Common Brown Snake (Demansia Textilis) for Common Laboratory Animals. C. H. Kellaway.—p. 747.

Brill's Disease or Pseudotyphus.—According to McGillivray, Brill's disease is a remittent fever lasting about fourteen days. The onset is usually sudden, accompanied often by severe headache, shivering and vomiting. The patient usually takes to bed. Headache is often intense, the temperature is usually from 38.3 to 39.4 C. (101 to 103 F.) for the first week of the disease; during the second week it is a little higher. About the end of the first week the rash appears and the patient feels worse; this is usually the time poorer patients reach the hospital. At this stage the face is red and swollen, the conjunctivae congested, the eyes glistening, and the headache still severe. There is pronounced cough, but little sputum; what there is is very sticky, and generally the appearance is that of an extremely toxic condition. The high temperature continues with daily remissions of about one degree fahrenheit till the twelfth day, when it falls by crisis or rapid lysis to normal by the fourteenth day. The pulse is slow compared with the rise in temperature. The rash is characteristic of the disease; it usually begins toward the end of the first week and has disappeared before the temperature reaches normal. When fully developed, it shows a dark subcuticular mottling with red points, rather as if one took the mottling of measles and superimposed on it the red points of German measles. It mostly occurs on the chest, abdomen, back and limbs, and is often most marked on the back. In most well developed cases of the disease there is some delirium or mild mental wandering at nights. The patient toward the end of the disease appears acutely ill, but on the temperature falling, convalescence is rapidly established. The mortality is usually quoted at 2 per cent. When death occurs it is usually due to lung complications, and on postmortem examination the most noticeable observation is fibrinous pleurisy with consolidation of portions of the lungs.

Tubercle, London

13: 97-144 (Dec.) 1931

Gelatinothorax in Treatment of Infective Conditions of Pleural Cavity. J. Crocket.—p. 97.
An Improved Artificial Pneumothorax Apparatus. P. Edwards.—p. 103.
Note on Isolation and Culture of Tubercle Bacillus from Sputum. R. Pearce.—p. 108.
Clinical Aspects of Silicosis. C. L. Sutherland.—p. 110.

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Annales de Médecine, Paris

30: 297-400 (Nov.) 1931

*Thyroid and Sympathetic Nervous System in Exophthalmic Goiter. D. Danielopolu.—p. 297.
Changes in Blood Proteins in Course of Diabetes Mellitus. M. Labbé and R. Boulin.—p. 340.
Chronic Rheumatism: Two Cases. G. Étienne, Drouet and Neiman.—p. 365.
Bronchoscopy in Diagnosis and Therapy in Bronchopulmonary Diseases. A. Soulas.—p. 372.

Thyroid and Sympathetic Nervous System in Exophthalmic Goiter.—In view of his anatomic, etiologic, experimental and clinical studies Danielopolu asserts that exophthalmic goiter is a disturbance characterized anatomically by a specific lesion of the thyroid, clinically by a series of phenomena related to amphotony. The variations of symptoms (true or abortive Basedow's disease, toxic adenoma of Plummer, para-Basedow's or Basedow-like syndrome) are all variations of the same disease. These different forms are due to the variability of the general sympathetic system, of the cervicothoracic sympathetic chain and of the local tonus of all the organs innervated by the sympathetic system. The thyroid factor and the sympathetic factor work hand in hand and form a vicious circle. The thyroid factor includes a deficiency in the supply of iodine and a disturbance in the iodine metabolism. The thyroid secretion is double: one part passes directly into the blood and another part is stored in the colloids. Amphotony is sympathetic (eyes, heart, blood, vessels) and parasympathetic (digestive system, sweat glands). The author admits the frequency of amphotonic types, the absence of vagotonic types and the infrequency of sympathicotonic types of exophthalmic goiter. Thyroidectomy is more efficient than sympathectomy. Iodine diminishes thyroid hyperplasia and facilitates the accumulation of colloid in exophthalmic goiter; it diminishes the hyperplasia and the colloid in colloid goiter. But the indiscriminate administration of iodine may exaggerate the thyroid secretion and aggravate the disease.

Écho Médical du Nord, Lille

35: 613-624 (Dec. 26) 1931

*Routes of Approach to Anterior Mediastinum and Upper Thoracic Cavity. O. Lambret.—p. 613.

Routes of Approach to Anterior Mediastinum and Upper Thoracic Cavity.—Lambret recommends combining the median vertical section of the sternum with section of the clavicle when more room is needed to work in as in posteriorly situated dermoid cysts, or when the posterior part of the thoracic cavity or the pleural dome is involved. Section of the clavicle at the union of its middle and inner thirds renders décollement of the parietal pleura and collapsing of the apex as well as access to the pericardinum an easy procedure. Accessibility may even be increased by allowing the patient's arm to hang vertically over the side of the operating table. The skin incision takes the form of an inverted L with the smaller arm over the clavicle up to its middle third. The sternum is sectioned in the usual way, the clavicle with a Gigli saw, and the sternocleidomastoid muscle is detached with a rongeur. After the sternal section has been lifted, décollement of the pleura is proceeded with and can be done so as wholly to expose the superior thoracic cavity. Drainage is extrapleural and preferably through the axilla. The author describes the different steps of this operation on one of his patients suffering from a dermoid cyst situated in the posterior part of the thorax, behind the pulmonary apex and the great vessels.

Journal d'Urologie Médicale et Chirurgicale, Paris

32: 393-480 (Nov.) 1931

*Genital Tuberculosis of Young Men: Statistical and Therapeutic Considerations. G. Parvulescu and H. Vascoboinic.—p. 393.
Renal Function: Nyiri and Phenolsulphonphthalein Tests. G. Giordanengo.—p. 423.
Access to Terminal Ureter by Raised Inguinopelvic Route. P. Constantinesco.—p. 438.

Genital Tuberculosis of Young Men.—According to Parvulescu and Vascoboinic, genital tuberculosis in young men has as a rule a rapid evolution and the testis is more often involved than is usually stated. Etiologically traumatism should probably be considered on account of the great physical activity natural in young men. Treatment should be conservative and adapted to the lesions found. If surgical treatment is decided on, all scrotal lesions must be extirpated as the principal advantage of surgery in these cases is the rapidity of the cure: consequently this treatment is indicated for patients who cannot afford a protracted medical treatment. Epididymectomy should be performed if the testis is not involved; semicastration is indicated especially in infected fistulous tracts and when the testis is threatened. In case of doubt, ample exploratory orchiotomy is advisable. In bilateral disease, no mutilating treatment is permissible. Spontaneous cures are frequent in young subjects.

Presse Médicale, Paris

39: 1605-1620 (Nov. 4) 1931

*Hepatic Elimination of Tetiothalein Sodium and Its Relation to Cholecystography. M. Chiray, J. Lesage and E. Taschner.—p. 1605.

Hepatic Elimination of Tetiothalein Sodium and Its Relation to Cholecystography.—When Chiray and his co-workers utilized tetiothalein sodium in cholecystography, their study was based primarily on the property of the liver for selective elimination. Although the problem had been studied in animals, the authors believe the studies in man have not been sufficiently controlled. Their aim was to determine a rhythm for the elimination of tetiothalein sodium by the liver and in that way bring about certain improvements in cholecystography. They selected a variety of patients, including some with disturbances in the tonus of the gallbladder, or with dysfunction of the vagosympathetic system and in whom intubation served as an important therapeutic interest from the point of view of the gallbladder. The procedure consists in making comparisons of numerous cases so as to form a standardized curve which would indicate with the greatest possible precision the primary, maximum and final elimination of iodine in the hepatic bile and also the tetiothalein sodium remaining after digestive absorption. Nerve sedatives are given the patient to insure against intestinal spasms during intubation. Altogether four cachets containing 0.8 Gm. of tetiothalein sodium each, with a total dosage of 3.2 Gm., are administered. The cachets are given one after another at different time intervals depending on the conditions of the test. The duodenobiliary drainage, with the collection of A, B and C bile fractions, is performed in the usual manner. The iodine in the bile is calculated by the use of standardized methods. In each test the C bile was collected for half an hour and measured in centimeters; the concentration of iodine per liter of bile was calculated, and the net weight of iodine eliminated in a half hour at various intervals after absorption of the cachets of tetiothalein sodium was determined. This the authors designated as the coefficient of cellular excretion of iodine. The study included twenty-four patients, each examined several times. The elimination of iodine by the liver was noted the third hour after the injection of the dye; the maximum was reached from the tenth to the thirteenth hour and elimination was continued for a variable time with traces present until the fourth to the eighth day. The study of the excretion of iodine in the bile after injection or ingestion of tetiothalein sodium makes possible the study of the physiology of the liver and the gallbladder as well as the mechanism of cholecystography. A negative cholecystographic examination should not always be interpreted as a sign of grave gallbladder disturbance, since one must consider the liver, which assures the elimination of iodine, and modifications of the gallbladder mucosa, which assures the concentration and fixation of iodine.

39: 1669-1684 (Nov. 14) 1931

*"Effort" Thrombophlebitis. C. Lenormant and H. Mondor.—p. 1669.
Epidemic of Chickenpox with Herpes Zoster. P. J. Braslawsky.—p. 1671.

"Effort" Thrombophlebitis.—Lenormant and Mondor recognize that thrombophlebitis may appear spontaneously in normal individuals, who attribute this condition, rightly or wrongly, to traumatism or effort. Many instances are cited in the literature—at least fifty are conditions of traumatic or effort phlebitis of the upper limbs, most often the right upper limb. The authors review two personal observations; the first is a clinical history, the second is more complete and convincing since surgical intervention made possible a histobacteriologic examination of the vein and the clot. It is their belief that thrombophlebitis is an infectious disease due to bacteria lodged in the wall of the vein or in the clot; that the influence of effort or traumatism in the appearance of thrombophlebitis is

indirectly minimal; that in that case the condition is latent thrombophlebitis of infectious origin revealed by effort or traumatism indirectly; and that "effort" phlebitis should be added to "effort" orchitis among the list of disease entities that are actually not demonstrated and very probably imaginary. Treatment in the majority of cases of thrombophlebitis includes rest, compress dressings, elevation of the limb; and the patient improves more or less slowly with more or less important sequelae and hardly ever emboli. Surgical intervention usually consists in the resection of the thrombosed vein between two ligatures. However, the small number of such interventions reported in the literature does not permit a definite conclusion at present.

39: 1685-1708 (Nov. 18) 1931

*Asthma and Fever. F. Bezançon and A. Jacquelin.—p. 1685.
Ovarian Endocrinology. R. Courrier.—p. 1688.
Skin Manifestations in Venous Diseases: Edemas. G. Delater.—p. 1690.
Serum Sickness, Vaccinal Shock and Biotropism. P. Chantriot.—p. 1692.

Asthma and Fever.—Bezançon and Jacquelin found that febrile infections may sometimes cause the appearance or reappearance of asthmatic attacks with fever so high that the conditions are often mistaken for capillary bronchitis or bronchopneumonia. It is difficult to explain the mechanism in which an acute infection leads to sedation of more or less serious and prolonged asthma. Fever can both produce asthma and arrest it. This power is vested in general acute infections without distinct localization (influenza, a seasonal infection, septicemia, eruptive fever), sudden infections (tuberculosis), localized nonsuppurative infection (appendicitis), suppurative infections (tonsillar or peripharyngeal phlegmon, abscess of lymph node, lung abscess, suppurative osteomyelitis of tibia, furuncle, anthrax). The efficacy of the liver is completely independent of the cause that produces it. These febrile states are all accompanied by intense polymorphonucleosis. During the fever the authors recommend a very reduced dietary regimen, no chlorides, plenty of fluids, juices of fruits and vegetables, also rest in bed, and prescription of cholagogues and laxatives. The aim should be to counteract the intoxication during the fever and diminish the asthmatogenous autointoxication resulting from fatigue, dietary abuse, and hepatic deficiency. During asthmatic attacks the alkali reserve is increased and the p_H of the blood is decreased. Fever interrupts asthmatic attacks when it prevents the displacement of the acid-base balance toward the alkaline side. Asthma is characterized by an increase in mononuclear leukocytes and eosinophils and a decrease in polymorphonuclear leukocytes. Favorable medications should produce leukocytosis with polymorphonucleosis: injections of epinephrine, peptone, vaccines, phlyctenotherapy, and ultraviolet irradiation in strong doses. Induced hyperthermia works in the same manner as spontaneous hyperthermia. Pyretotherapy is especially indicated in asthma with subintrant crises as well as conditions of permanent dyspnea caused by asthma. The authors consider the use of massive doses of ultraviolet rays with induced temperature of from 38 to 38.5 C. for from twenty-four to forty-eight hours; subcutaneous injections of autovaccines, stock lysate vaccines and antichancroid vaccines with single doses not smaller than two billion organisms injected at intervals of two or three days as contraindicated. Intravenous injections of antichancroid vaccines are most easily regulated; however, a fixation abscess (from 1 to 2 cc. of oil of turpentine injected subcutaneously) although painful is also efficient. The recurrent asthmatic attacks after treatment are not so severe and are then more easily treated with epinephrine or ephedrine.

39: 1709-1724 (Nov. 21) 1931

Relation Between Maximum Respiratory Output and General State of Nutrition. J. L. Pech and E. Delcroix.—p. 1709.
*Action of Roentgen Irradiation of Suprarenal Region in Treatment of Diabetes Mellitus. L. Langeron, R. Desplats and J. Béra.—p. 1709.
Ether Narcosis by Rectum. E. Fermaud.—p. 1711.

Roentgen Irradiation of Suprarenal Region in Treatment of Diabetes.—Langeron and his co-workers do not believe that their researches during the last two years warrant definite conclusions; however, their impressions of the results obtained seem worthy of note. They describe the results obtained in eleven patients under observation and conclude that in diabetes of moderate intensity one can obtain through roentgen irradiation of the suprarenal region and without inconvenience interesting abatement in the glycosuria; in severe diabetes with acidosis, on the contrary, the results are negative and the method is distinctly contraindicated. The results obtained in the first series are sufficiently interesting to favor treatment. Only diabetes is considered in this report, arterial symptoms and trophic disturbances having been considered in other articles. The results in roentgen therapy are equivalent to those obtained after denervation of the suprarenals.

Archivio Italiano di Urologia, Bologna

7: 239-350 (Nov.) 1931

*So-Called Malignant Nephrosclerosis (Fahr). G. Patrassi.—p. 239.
Rare Tumors of Bladder. R. Rizzi.—p. 306.
Congenital Vesicorenal Backflow with Dilatation of Upper Urinary Passages. A. Paladini.—p. 337.
Small Catheter for Ureteral Examination in Presence of Obstruction in Meatus Urinarius and in Ureteral Canals. C. Chiaudano.—p. 344.

So-Called Malignant Nephrosclerosis (Fahr).—Patrassi discusses, on the basis of seven cases of renal sclerosis (in most of which death had resulted from renal insufficiency), the conception of malignant renal sclerosis in its morphologic and pathogenic characters. The fundamental change in the small arteries consisted of arteriosclerosis with hyaline degeneration of the walls. No true necrosis or fibrinoid degeneration of the arterial walls was encountered. Even in case of ischemic infarct of the kidney the necrosed arteries did not show a special affinity for fibrin (Weiggert method). With respect to intensity and course the lesions of the arterioles and of the glomeruli did not always run parallel. The latter, especially when subjected to excessive work (as in compensatory hypertrophy), may become primarily involved. Of great importance for the genesis of the tubular changes are the thickening and the hyalinization of the basal membrane of the tubules. These changes, from a pathogenic and functional point of view, are comparable to those of the basal membrane of glomerular loops.

Bollettino d. Istit. Sieroter. Milanese, Milan

10: 665-748 (Nov.) 1931

Action of Magnesium Chloride on Hemolytic Amboceptors. F. Buonomo La Rosa.—p. 665.
Pathogenic Action of Klossiella Muris on Kidney of Mouse and Transmission of Coccidium from Mouse to Guinea-Pig. Olga Cannarella.—p. 670.
Vitamin C Deficiency and Anaphylaxis. R. Severi.—p. 685.
*Experimental Researches to Identify Cancrigenic Agent of Coal Tar. L. Lazzarini.—p. 696.
The Henry Reaction in Clinical Diagnosis of Malaria. E. Bonalberti.—p. 711.
Enzymes and Immunity. M. Ghiron.—p. 720.
Physicochemical Study on Tuberculins. L. Villa.—p. 723.
Influence of Acidity of Serum in Zammit Lactoreaction and Useful Change in Technic. I. Pisu.—p. 734.

Research to Identify Cancrigenic Agent of Coal Tar.—Lazzarini searched in the white mouse for the cancrigenic substance of tar. The first research deals with the black granulations that are commonly observed in the internal organs of mice whose skin has been tarred. The microchemical researches produced uncertain results. The second research refers to phenols and to the pyridic bases extracted from the internal organs of the mouse by means of distillation in a jet of steam; the results furnish negative evidence for the action of these substances. The third research is made on pyrolic and indolic compounds; the author succeeded in demonstrating an oncogenic action of these substances in three ways: (1) finding of indole and pyrol in the internal organs of mice treated with tarring of the skin; (2) provoking cancer in mice treated with parenteral injections of indole and pyrol and not thoroughly tarred, and (3) ascertaining that in animals treated only with injections of indole and pyrol, changes similar to those that are to be observed in mice simply tarred appear in the internal organs. Having thus demonstrated the cancrigenic action of indole and pyrol, the author adds that, even if these substances possessed a cancrigenic action, it alone would not be sufficient to provoke a cutaneous cancer but would require other adjuvant forces, which are to be sought not only in other components of tar but also in special individual and ambient conditions. The author, in conclusion, formulates tar complex (C), plus organism complex (O), plus stimulus factor (S), as the probable pathogenesis of the cutaneous tar cancer, assigning to the first group (C) the compounds of the pyrolic and indolic group; to the second group (O) the defense reaction of the tissues and allergic defense, and to the third group (S) the inflammations.

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Semana Médica, Buenos Aires

38: 1741-1808 (Dec. 10) 1931. Partial Index

Surgical Diathermy in Treatment of Cancer. J. M. Jorge.—p. 1741.
Vaginal Route in Surgery of Tumors of Internal Female Genital Organs. A. Chueco.—p. 1749.
Cortical Hepatitis Causing Hepatic Colic. R. Solé.—p. 1757.
*Mean Blood Pressure in Goiter. E. B. del Castillo and A. F. Nanclares. —p. 1766.
Circumscribed Forms of Tuberculosis of the Bones. M. J. Fitte.—p. 1773.
Semeiologic Interpretation of Teleroentgenograms of "Middle Arc." P. Cossio, R. Dassen, R. Lottero Lanari and I. Berconsky.—p. 1786.

Mean Blood Pressure in Goiter.—Castillo and Nanclares made oscillometric determinations of the mean blood pressure in twenty-eight persons with several forms of goiter, with and without hyperthyroidism. The first group (goiter patients with hyperthyroidism) included fourteen patients with toxic adenoma and seven patients with exophthalmic goiter. The second group (goiter patients without hyperthyroidism) included seven patients with nontoxic adenoma. The author concludes: The mean blood pressure is increased in 44 per cent of patients with toxic adenoma and is normal in 56 per cent. There is a relative increase of the mean blood pressure in patients with exophthalmic goiter. The mean blood pressure is normal in patients with nontoxic adenoma.

38: 1809-1892 (Dec. 17) 1931

Treatment of Intestinal and Biliary Infections by Bacteriophage. H. J. d'Amato, R. Gorlero Pizarro and R. Vacarezza.—p. 1809.
Surgical Diathermy in Otorhinolaryngology: Present Condition. L. Samengo.—p. 1816.
*Treatment of Exophthalmic Goiter and Hyperthyroidism by Intravenous Injections of Sodium Fluoride. L. Goldemberg.—p. 1833.
Individual Constitution According to Italian School. D. Boccia.—p. 1837.
Paralytic Ileus of the Colon During a Myocardiac Syndrome. G. Costa Bertani.—p. 1879.
Symptomatologic Value of Thoracic Mobility Without Respiration. A. C. Menzani.—p. 1883.
Laws of Heredity in Pathology and Their Relations with Social Medicine. L. C. Perrusi.—p. 1884.

Treatment of Hyperthyroidism by Intravenous Injections of Sodium Fluoride.—Goldemberg states that animal experimentation has proved that fluorides retard development and produce the same results as if the young animal were thyroidectomized. One milligram of thyroxine in solution is precipitated by 0.01 Gm. of sodium fluoride, immediately on or after several minutes of contact. The logical next step is the administration of sodium fluoride in human hyperthyroidism. The author describes the good results obtained in twenty days with daily doses of from 40 to 60 drops of a 2 per cent aqueous solution of sodium fluoride, given by mouth in the first patient treated by the new method. However, intolerance to buccal medication in subsequent patients imposed the use of tentative intravenous injections beginning with 1 cc. of a 0.5 per cent aqueous solution, later changed to 1 per cent, then to 2 per cent and at last to the optimum of 2.5 per cent; the dose increasing to 5 cc., 10 cc., 25 cc. and even 35 cc. without any bodily intolerance or bad effect on the veins used for the injections. When the intravenous dose of fluoride is higher than 0.1 Gm. per injection, irrespective of the titer of the solution in use, patients complain, within ten minutes after the injection, of pain and cramps in the lumbar region or in the abdomen, lasting from five to ten minutes. Extravasation of some drops of the fluoride solution into the cellular tissue will produce local pain, burning and swelling which disappear in a few hours without leaving any local necrosis. Doses higher than 0.1 Gm. of fluoride or several daily injections will react with a polyuria of 4 or 5 liters of urine daily, intense thirst, nycturia and pollakiuria, but never with albuminuria and glycosuria. These symptoms disappear two or three days after suspension of the treatment. Therapeutic action of the fluoride is slow and progressive. The nervous symptoms disappear first, sleep returns, tachycardia diminishes and the palpitations vanish. The patient gains in weight, the basal metabolism becomes practically normal, the thyroidal swelling goes down and the exophthalmos, although not disappearing completely, is greatly reduced. The author uses a solution of 2.5 Gm. of pure sodium fluoride in 100 cc. of distilled water; the solution is filtered, put in 5 cc. ampules and sterilized in the autoclave. Injections are started with 3 cc. of this solution, gradually increased to 6 cc. and maintained until improvement sets in, then decreased to 4 cc. and continued until a series of from fifteen to twenty injections have been given. In the beginning, depending on the seriousness of the condition, injections are administered every day or every other day and later, when justified by the improvement, every three or every four days; from then on the series of injections alternate with rest and the whole treatment runs its course in from five to ten months. It is advisable to institute two or three series of injections annually during the subsequent two or three years. If treatment by mouth is desired to alternate with the injections, the solution is made with 2 Gm. of sodium fluoride or ammonium fluoride in 100 cc. of distilled water, and from 10 to 50 drops in milk are given four times a day during a period of fifteen to twenty days. In other words, the dosage increases steadily from 40 to 200 drops a day. Treatment by sodium fluoride may also be given to prepare the patient for surgical intervention in case of voluminous goiter and when the patient is in no condition to stand a protracted medical treatment.

Archiv für Kinderheilkunde, Stuttgart

95: 65-144 (Dec. 18) 1931

*Treatment of Asphyxia in the New-Born and of Dyspneic Conditions in the New-Born and in Nurslings by Means of Carbon Dioxide Gas Mixtures. R. Wiener.—p. 65.
Infantile Sudamina or Infantile Miliary Epidemic Exanthem: Its Clinical Aspects and Differentiation from Sudor Anglicus. A. Stroé and H Stroé.—p. 78.
Remarks on Preceding Article: Likeliness of Identity of Infantile Sudamina and Sudor Anglicus. Rietschel.—p. 89.
Cases of Pyuria Caused by Dysentery Bacilli. Z. Teveli.—p. 92.
Liver Therapy of Anemias in Nurslings. F. Strunz.—p. 98.

Treatment of Asphyxia in the New-Born by Means of Carbon Dioxide Gas Mixtures.—Wiener first discusses the various means and methods that are employed in the treatment of asphyxia in the new-born and in severe dyspnea in the new-born and in nurslings. Particular attention is given to carbon dioxide gas mixtures, which in recent times have found a wide application. Further, the author relates his experiences with carbon dioxide gas mixtures in twelve cases of asphyxia in the new-born, in twenty-three cases of severe dyspnea during the first days of life, in six cases of respiratory disorders and collapse in nutritional disturbances, and in seventeen cases of diseases of the air passages and of the lungs. On the basis of these observations he considers the use of carbon dioxide air mixtures and of carbon dioxide oxygen mixtures as that method, which in asphyxia of the new-born, as well as in dyspneic conditions of the new-born and of nurslings, is always applicable and in the majority of cases accomplishes its purpose.

Deutsche medizinische Wochenschrift, Leipzig

57: 2169-2194 (Dec. 25) 1931

Clinical Significance of Pathologic Physiology. R. Siebeck.—p. 2169.
*Syndrome Frequently Observable in Commotio or Contusio Cerebri. L. Mann.—p. 2172.
Hockey Injury. A. Arnold.—p. 2175.
Epidemiology of Influenza in Last Three Years. R. Bihler.—p. 2177.
Simplification and Improvement of Heisler-Moro Apple Diet. S. Wolff. —p. 2178.
Functional Liver Diagnosis. B. Weicker.—p. 2179.

Syndrome Observable in Commotio or Contusio Cerebri.—Mann emphasizes that the detection of the general postcommotional syndrome is not sufficient, but that efforts should be made to detect certain groups of symptoms which indicate a definite cerebral localization. He admits that it is not entirely correct to designate such localized cerebral symptoms as signs of a commotio cerebri, for they are rather foci of contusion. However, it should be considered that between "commotio" and "contusio" there is only a quantitative difference. If the injurious force that strikes one portion of the brain is especially severe, a contusion is the result with its visible and permanent anatomic changes. Such symptoms of contusion may occasionally develop entirely without or with only slight commotional manifestations, but in the majority of cases the symptoms of contusion at first concur with those of commotio. The author then describes the syndrome that he observed most frequently in traumas of the brain. The symptoms are the following: 1. There is difficulty in directing the eyes to one side, while they can be readily directed to the other. 2. When the patient stands with closed eyes a swaying toward the same side is noted on which the visual direction is impaired. 3. In

the past-pointing test a deviation to the same side is noted. 4. Frequently there is a unilateral absence of the normal oscillations of the arms during walking. 5. The hearing capacity is impaired on the side corresponding to the side with the impaired visual direction. 6. The reflexes of the cornea and of the nasal mucous membrane are reduced on the same side. 7. In addition to these local symptoms there are also generalized symptoms such as general vasomotor hypersensitivity, with acceleration of the pulse and a rushing of the blood to the head, and in some of the cases the pressure of the cerebrospinal fluid is increased. If all these symptoms are considered as a whole it can be seen that they are essentially coordination disturbances, and since the coordinatory functions are controlled mostly by the cerebellum and its tracts, the author assumes that the syndrome is characteristic for cerebellar disturbances or at least for the disturbances of the posterior cranial fossa. He goes even further in his attempts to localize the injury producing the described syndrome, by citing facts that indicate localization in the corpus restiforme.

Jahrbuch für Kinderheilkunde, Berlin

134: 1-128 (Dec.) 1931

Spring Catarrhs. K. Stolte.—p. 6.
Congenital Atresia of Ileocecal Valve. A. Wilke.—p. 10.
Strabismus in Early Childhood. R. Hessberg.—p. 15.
Acute, Generalized, Cutaneous, Miliary Tuberculosis During Childhood. E. Nedelmann.—p. 24.
Examination of Gastric Function by Means of Fractional Withdrawal. R. Sperling and Elisabeth Jungbluth.—p. 29.
Epigastricus Parasiticus: Contribution to Casuistics on Double Monsters. K. Seynsche.—p. 40.
*Influence of Intramuscular Injection of Blood on Temperature and Clinical Course in Interlobar Pleurisy and in Other Diseases of the Respiratory Tract. Berta Bals.—p. 51.
*Endocardial Fibrosis of Young Nursling. Käthe Becker.—p. 64.
Pneumothorax Therapy of Tuberculosis in Nurslings and Its Significance for Increase in Resistance. Maria Paulus.—p. 72.
Observations During Epidemic of Anterior Poliomyelitis. Bossert.—p. 79.
Bite of Field Mouse Causing Disease Similar to Sodoku (Rat Bite Fever). Elisabeth Jungbluth.—p. 85.
*Acetarsone in Treatment of Congenital Syphilis. E. Nedelmann.—p. 89.
Severe Lipemia in Child with Diabetes Mellitus. Elisabeth Jungbluth.—p. 102.

Intramuscular Injection of Blood in Diseases of the Respiratory Tract.—Bals states that in recent years hemotherapy has found wider application in pediatrics. Interlobar exudates, which are often refractory to most therapeutic measures, were found to yield to intramuscular injection of blood. In chronic febrile diseases of the respiratory tract this form of hemotherapy proved likewise effective. The author recommends for such cases the intramuscular injection of small quantities (from 20 to 60 cc.) of whole blood. Of course, she does not wish to discredit intravenous blood transfusion, but she points out that intramuscular injection is more practical, since it makes preparatory serologic tests superfluous and also because its technic is simpler. Moreover, the small amounts of blood that are required are usually readily obtainable. Injurious effects of blood injections are unknown, and the resorption is usually rapid. Long periods of fever can often be shortened, and the disease can be cured more quickly by this form of hemotherapy. For this reason, intramuscular injection of blood should always be given a trial.

Endocardial Fibrosis of Young Nursling.—Becker observed indurated fibrosis in the left cardiac ventricle in a nursling, aged 3 months. She considers this endocardial fibrosis as the thrombogenic type for she assumes a causal relationship between the thrombophlebitis of the right leg, to which the mother was subject during pregnancy, and the endocardial fibrosis in the infant.

Acetarsone in Treatment of Congenital Syphilis.—Nedelmann maintains that acetarsone is the best substance for the treatment of syphilis in early childhood. Years of experience convinced him that acetarsone should not be given in several small series of treatments, but if possible should be completed in one series with sufficiently large doses. He confirms the roborant action of acetarsone but warns against the use of the preparation in nonsyphilitic conditions. For cases of hypersusceptibility to acetarsone he recommends intramuscular injections of a liver extract. He also reports investigations on the elimination of arsenic in the feces and in the urine of children treated with acetarsone.

Klinische Wochenschrift, Berlin

10: 2377-2408 (Dec. 26) 1931

Chronaxia. H. Quincke and J. Stein.—p. 2377.
*Fat Metabolism Hormone of Anterior Lobe of Hypophysis. K. J. Anselmino and K. Hoffmann.—p. 2380.
*Idem. F. Hoffmann and K. J. Anselmino.—p. 2383.
Metabolic Changes in Otosclerosis. H. Behrendt and J. Berberich.—p. 2386.
Serum Colloids in Normal and Pathologic Conditions. A. Schmitz.—p. 2388.
Bacteriologic and Serologic Investigations in Tuberculosis and in "Rheumatic" Diseases. H. Horster.—p. 2389.
Epicutaneous Tuberculin Reaction in Tuberculosis of Skin. E. Nathan and P. Kallós.—p. 2392.
Newer Tests of Cerebrospinal Fluid for Differential Diagnosis of Syphilitic Disease of Central Nervous System. A. Marchionini.—p. 2393.
Iodine Distribution Following Injection of Iodine Preparation. J. Olivet.—p. 2396.
Small Heart of Patients with Asthma. K. Haàos.—p. 2397.

Qualities of Fat Metabolism Hormone of Anterior Lobe of Hypophysis.—In the introduction Anselmino and Hoffmann call attention to the three principal actions of the anterior hypophysis, namely, its influence on growth, on the generative glands, particularly the ovaries, and on the fat metabolism. Disturbances in the fat metabolism, as observed in adiposogenital dystrophy or after extirpation of the anterior hypophysis, had led several authorities to assume a hypophyseal action on the fat metabolism, but it remained for the authors to detect, prepare and study the qualities of the hormone. After citing factors that indicate the existence of a hypophyseal hormone effective on the fat metabolism, they describe its preparation from the anterior hypophysis of beeves. The increase of the acetone body content of the blood of rats, to which that extract has been administered, is the test method for the hormone. With the aid of this test the authors determined also the chemical and physical qualities of the metabolic hormone, which are largely identical with the known qualities of the genitally active component of the anterior hypophysis. But in spite of this the metabolic hormone differs from the genitally active component. Factors are cited that establish the identity of the demonstrable acetone body increasing substance with the metabolic hormone. For the standardization of the hormone the authors recommend the rat unit and give its quantitative definition.

Effects of Fat Metabolism Hormone of Anterior Lobe of Hypophysis.—Hoffmann and Anselmino describe various metabolic and regulatory effects of the metabolic hormone of the anterior lobe of the hypophysis. Administered in sufficiently large doses to rats and also to human beings, the metabolic hormone effects acetone body formation, especially beta-oxybutyric acid formation, also a decrease in the basal metabolism and an increase in the specific dynamic action. The hormone is discharged when fat is burned in the organism. This regulatory significance of the metabolic hormone for fat combustion can be demonstrated in fat tolerance tests on human beings and in starvation tests on dogs. Finally the authors call attention to the significance of the metabolic hormone for a number of problems in normal and pathologic physiology.

Medizinische Klinik, Berlin

27: 1813-1848 (Dec. 11) 1931

Significance of Roentgen Diagnosis in Obstetrics. W. Liepmann.—p. 1813.
*Systolic Blood Pressure in Older Persons. H. May.—p. 1816.
Intravenous Combination Therapy in Acute Circulatory Insufficiency. H. Strauss.—p. 1818.
Sodium Dehydrocholate in Treatment of Melancholia. H. Hartmann and M. Weissmann.—p. 1819.
Aconite Therapy of Trigeminus Neuralgia. K. Rewicz.—p. 1821.
Toxic Polyneuritis Following Use of Abortifacient. L. Stanojević and V. Vujić.—p. 1821.
Peritonitis of Renal Origin. A. Stapf.—p. 1824.
Secretion of Fasting Stomach Following Parenteral Irritation and Test Drink. L. Dinkin.—p. 1825.
Dietary Regimens in Internal Diseases. W. David.—p. 1828.

Systolic Blood Pressure in Older Persons.—A review of the literature convinced May that the opinion prevails that in older persons the blood pressure is higher. He maintains, however, that clinical observations do not corroborate this. Tests on 518 persons, some of whom had circulatory disorders and some of whom did not, revealed that the "normal" (he prefers the term "rest blood pressure") is between 100 and

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145 mm. of mercury in all age groups. The apparently contradictory results of former tests he explains as the result of a greater lability of the blood pressure in not resting persons beyond the age of 40 years. The question is discussed whether these blood pressure fluctuations may not be the precursor of the transitory and also of the fixed hypertensions.

27: 1849-1884 (Dec. 18) 1931

Clinical Aspects and Treatment of Perforating Gastric Ulcer. R. Mühsam.—p. 1849.
*Pathologic Significance of Bleeding Mamma. B. O. Pribram.—p. 1853.
Technical Improvement of Obliteration of Varicose Veins. G. Nobl.—p. 1855.
Origin and Evaluation of Trendelenburg's Phenomenon. W. Löwenstein and G. Kopfiwa.—p. 1857.
Therapy of Exudative Pleurisy During Childhood. A. J. Chura.—p. 1858.
Retrogastric Hemorrhage with Development of Cascade Stomach. J. Arendt.—p. 1859.
Congenital Total Hemihypertrophy. Esau.—p. 1861.
Course of Secretion of Fasting Stomach Following Parenteral Irritation and Test Drink. L. Dinkin.—p. 1864.
Blood Transfusion, Autohemotherapy and Serum Injection in Surgery. E. Sehrt.—p. 1866.
Sterilization and Interruption of Pregnancy. L. Gelpke.—p. 1867.
Dietary Regimens in Internal Diseases. W. David.—p. 1868.

Pathologic Significance of Bleeding Mamma.—Pribram shows that hemorrhage into the mamma usually takes place into preformed cysts. If such a cyst communicates with the main discharging duct, blood is discharged by the mammilla. But the discharge of blood is no indication of a malignant tumor. On the contrary, hemorrhages are a rarity in closed cancer of the mamma. The most common cause of hemorrhage of the mamma is an intracanalicular hemorrhagic cystepithelioma, a small tumor, which is regularly located in a cystic enlargement of one of the larger lactiferous ducts. This tumor takes a median position between benign and malignant growths, but it shows no tendency to relapse and metastasize. During long years of observation the author never observed a relapse, in spite of the fact that he never performed a radical amputation with removal of the lymph nodes but always confined himself to the extirpation of the mamma. This conservative surgical attitude seems the more justified because the majority of the patients were young women and usually the cyst formation was bilateral. However, it is necessary to keep such women under constant medical observation.

Zeitschrift für urologische Chirurgie, Berlin

33: 363-527 (Dec. 11) 1931

Ureteral Plastics and Implantation of Ureter. A. Baidin.—p. 363.
Renal Resection on Account of Extravesical Ureteral Ostium. A. von Adler-Rácz.—p. 398.
Spina Bifida and Upper Urinary Passages. E. Lehmann.—p. 406.
*Orifice of Ureter and Bladder Contraction. W. J. Israel.—p. 423.
*Function of Upper Urinary Passages Following New Implantation of Ureter Into Bladder. W. J. Israel.—p. 442.
Torsion of Testicular Appendix. V. W. Dix.—p. 486.
Significance of Elimination Pyelography for Estimation of Urinary Apparatus in Old Strictures of Urethra. F. Dannheisser.—p. 495.
Problem of Simultaneous Bilateral Nephrolithotomy or Pyelolithotomy. M. Mamikonoff.—p. 506.
Parametritis, Ureteral Stricture and Hydronephrosis. K. Boshamer.—p. 511.

Orifice of Ureter and Bladder Contraction.—In this paper Israel reports his studies on (1) the behavior of the ureteral orifice during the contraction of the bladder, and (2) the causes of an eventual closing. In regard to the first problem he states that experiments on dogs, in which vesical contractions were produced by faradic stimulation of the pelvic nerve, indicate that during vesical contraction, at least during the largest portion of its duration, the ureteral orifice remains closed and urine does not enter the bladder. This interval of time is termed the "micturition pause of the ureteral orifice." Thus the animal experiments corroborate the cystoscopic observations that Boeminghaus made on human beings during the voluntary evacuation of the bladder. To the second problem the author remarks that experiments on the open bladder prove that the increase of the intravesical pressure during contraction and thus the active valve mechanism of the relaxed bladder do not play an important part in development of the micturition pause. Experiments on ureters recently implanted into the bladder prove that the omission of the urinary spurts of the ureteral ostium during the contraction of the bladder is dependent neither on the normal distal termination of the ureter nor on muscular or nervous connections between bladder and ureter. The essential cause of the omission of the urinary spurts of the ureteral ostium during vesical contraction is the compression of the distal termination of the ureter by the surrounding vesical muscles. The significance of the ureteral closing during contraction of the detrusor lies not in the development of the pause in micturition of the ureteral ostium but in the prevention of the ureteral reflux.

Function of Upper Urinary Passages Following Implantation of Ureter into Bladder.—This report brings the continuation of the studies described in the preceding article. Israel discussing the problem whether the closure produced by the muscular contraction is sufficient to prevent reflux without the other devices. In the summary he states that the prevailing opinion that atony and reflux are necessary sequelae of resection and reimplantation of the ureter are erroneous. Observations on dogs that were killed eleven and twelve months after the operation indicate the possibility of a permanent effectiveness of the implantation. Experiments prove that in dogs the ostium can be secured against reflux without resorting to the oblique passage of the ureter through the vesicular wall and without depending on the valvular closure produced by that procedure. Indispensable and alone sufficient to secure the upper urinary passages against reflux are (1) in the bladder that is filling or relaxed, the capacity of the ureter to contract sufficiently; (2) during contraction of the bladder the compression of the vesical termination of the ureter by the vesical muscles. These two factors that secure the newly formed ostium explain, according to their efficacy or inefficacy, the following conditions: (*a*) cases in which following implantation of the ureter into the bladder, the upper urinary passages retain their normal function; (*b*) cases in which reflux develops on the distal termination of the ureter following its implantation or after other operations; (*c*) numerous cases of spontaneously developing reflux; (*d*) the rare cases of cure of reflux by implantation of the ureter into the bladder.

Zentralblatt für Gynäkologie, Leipzig

55: 3617-3680 (Dec. 19) 1931

Changes in Human Uterine Tubes During Pregnancy. K. Naumann.—p. 3618.
*Inflammation with Abscess Formation in Salivary Glands of the New-Born. B. Kriss.—p. 3624.
Narcolepsia Gravidarum. Z. von Szathmáry.—p. 3629.
*Lochia After Cesarean Operations. F. H. Bardenheuer.—p. 3636.
Therapy and Prognosis of Eclampsia on Basis of One Hundred and Seventeen Cases. B. von Kontsek.—p. 3639.
Therapy of Secondary Anemias in Gynecology. S. Jülich.—p. 3644.
Behavior of Various Antispermatic Substances Within Female Genitalia. Hertha Riese.—p. 3647.

Abscess Formation in Salivary Glands of the New-Born.—Since former reports on this comparatively rare condition contain little about its pathogenesis, Kriss reports his investigations on this problem. Following the report of the clinical history of two cases he gives a general discussion of the clinical aspects and states that the therapy should follow general surgical principles. In regard to the bacteriologic conditions it is stated that staphylococci were found in the two reported cases and a number of other authorities observed the same; however, others observed streptococci, diplococci, Monilia albicans or a mixed bacterial flora. In a study of the pathogenesis of inflammation of the salivary glands in infants it is of course necessary to differentiate between the isolated inflammation of these glands and the inflammation as a partial manifestation of a generalized sepsis. The author discusses only the first form, for which there are two possibilities of pathogenesis, namely, a hematogenic and an ascending infection from the oral cavity. On the basis of his investigations he concludes that the isolated inflammation of the salivary glands is caused in the majority of cases by the ascent of pathogenic organisms from the oral cavity and invasion into the glands. For this mode of pathogenesis two factors are essential, namely, (1) the presence of pathogenic micro-organisms in the oral cavity of the new-born and (2) a factor that creates a predisposition. Investigations on the bacteriologic conditions in the oral cavity of the new-born revealed that shortly after birth the saliva is usually sterile but tests on nurslings between the first and eighth day of life revealed the presence of micro-organisms that can be considered pathogenic. In regard to the predis-

posing factors it is pointed out that in forceps deliveries the region of the parotid may be injured, and it is also emphasized that parotitis is especially frequent in premature infants, that is, in infants with lowered resistance against infections. Other predisposing factors may be high degree of virulence of the salivary bacteria, abnormalities in the excretory ducts of the glands and faulty sucking on the part of the child.

Lochia After Cesarean Operations.—Bardenheuer observed that after cesarean operations the lochia is surprisingly scanty and the involution of the uterus is more rapid than after normal delivery. As cause of this he considers the acidosis, which is produced by the postoperative starvation, for hunger, thirst and wound healing processes cause acidosis. He concludes that in normal puerperas the lochia could be reduced by giving for about eight days a diet like the one Herrmannsdorfer recommended for the treatment of wounds. This diet eliminates milk, potatoes, sausages, and most fruits and vegetables; the fluid intake is limited and seasoning with salt is avoided. Recommended are meat, fish, eggs, butter, lard, bread, foods prepared from flour, cheese, brussels sprouts, lentils, nuts, cranberries, lemon juice, cocoa, tea, coffee and honey. The fat intake should be high, but carbohydrates should be reduced.

Sovetskaya Klinika, Moscow

15: 387-596, 1931

Situs Inversus Viscerum. M. G. Solovey.—p. 387.
Peripheral Arteries of Brain Concomitant with an Underdevelopment of Carotid Artery. B. K. Gindtse and L. I. Freidman.—p. 395.
Clinical Aspect of Pernicious Anemia. K. Ya. Shkhvatsabaya.—p. 407.
Acute Myeloblastic Leukemia. A. I. Acharkan.—p. 417.
Clinical Aspect of Certain Anomalies of Large Intestine. V. N. Smotrov.—p. 427.
Changes in Gastric Secretion and Function of Intestine in Lowered Gastric Acidity Under Influence of Treatment. V. A. Alexandrov and D. I. Pavlov.—p. 439.
Multiple Polyposis of Colon. I. N. Sheftel.—p. 456.
Water-Salt Metabolism in Parkinsonism. V. N. Toparskaya and S. A. Chugunov.—p. 463.
Clinical Aspect and Pathology of Intraspinal Disks. S. S. Brusova and M. O. Santotskiy.—p. 473.
*Gas Analysis of Cerebrospinal Fluid in Nervous Diseases. A. E. Kulkov and M. E. Tarnopolskaya.—p. 482.
Value in Diagnosis of Cerebrospinal Fluid by Lumbar Puncture. M. I. Sokolov.—p. 502.
*Dry Pleurisy in Acute Rheumatic Infections of Children. L. D. Shteinberg and S. I. Kopeliovich.—p. 511.
Rheumatismal Corticopleuritis and Certain Factors in Pathogenesis of Rheumatism. N. V. Morakhovskiy.—p. 522.
Percussion in Broncho-Adenitis. N. N. Pisarevskiy.—p. 530.
Tuberculous Broncho-Adenitis in Adults. F. O. Gausman.—p. 536.
Clinical and Pathologic Aspects of Tuberculosis of Stomach and Liver. S. Genkin and I. Sosnovik.—p. 444.
Size of Erythrocytes in Tuberculosis. N. G. Vishnevskiy.—p. 555.
Professional Tendovaginitis Crepitans. G. D. Speranskiy.—p. 561.

Gas Analysis of Cerebrospinal Fluid in Nervous Diseases.—Kulkov and Tarnopolskaya as a result of their studies conclude that the carbon dioxide (alkali reserve) of the spinal fluid differs in disease. The largest determination for carbon dioxide of the spinal fluid (alkalosis) was found in dementia paralytica and epilepsy and one instance of alcoholism. Severe acidosis (decreased carbon dioxide) was found in various forms of meningitis, namely in toxemic forms, diffuse infection of the brain, encephalitis, diffuse sclerosis and symptomatic epilepsy. Determinations were normal in tumors of the brain and spinal cord and in tabes dorsalis. There was no greater tendency toward alkalosis in cerebrospinal syphilis. The relationship between carbon dioxide and other substances as globulins and chlorides was not studied. The authors noted an increase in carbon dioxide in tabetic atrophy of the optic nerves at the same time that other forms of tabes dorsalis gave normal carbon dioxide determinations.

Dry Pleurisy in Acute Rheumatic Infections of Children.—Shteinberg and Kopeliovich, in their examination of eighty-two children with rheumatism, diagnosed dry pleurisy and pericarditis in thirty-eight: nine patients with pleurisy and pericarditis, twenty-six with pleurisy alone, and one with pericarditis alone. They conclude that in the course of acute rheumatism one may also find a concomitant infection of dry pleuritis which runs its own clinical course. The presence of infection of the serous membrane is a frequent symptom of rheumatism. Dry pleurisy has a practical significance in the clinical prognosis of rheumatism (polyarthritis, chorea, carditis). Dry pleurisy may be the primary or the only symptom in rheumatic infection. In the course of the ambulatory forms of rheumatic endocarditis the condition may simulate the clinical picture of tuberculous intoxication. The relation of dry pleurisy of rheumatism to tuberculosis necessitates further study.

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*New Method of Treatment Using Specific Antidiphtheritic Serum. A. I. Yarotskiy.—p. 1559.
*Large Doses of Serum in Treatment of Toxic Diphtheria. A. B. Volovik.—p. 1567.
Neuropathy in Dystrophy of Meniscus Medialis. G. I. Turner.—p. 1574.
Mechanism of Action of Alcohol on Muscle and Nerve. M. R. Mogendovich.—p. 1580.
Relation Between Residual Nitrogen and Chlorides of Blood. Ya. Yu. Shpitz and E. S. Gliksberg.—p. 1582.
Bacteriophage in Treatment of Dysentery. S. N. Ruchkovskiy.—p. 1586.
*Fatality in Abortion Without Sufficient Hospitalization. A. Anufriev.—p. 1589.
Classification of Cerebrospinal Meningitis. N. G. Rubinshtein.—p. 1593.
Some Considerations on Epilepsy. V. M. Faybushevich.—p. 1596.

New Method of Treatment Using Antidiphtheritic Serum.—Yarotskiy believes the high mortality in diphtheria is unwarranted. It is possible to bring the mortality down to 0.4 per cent. He believes that smaller doses than 10,000 antitoxic units should not be used and in severe conditions this dose should be repeated within the same day and repeated in the following days until toxic symptoms disappear or become minimal. During treatment no days should pass without an injection of serum. The author describes his results in the treatment of 248 patients with various types of diphtheria. Horse serum was used throughout. The injections were performed intramuscularly.

Large Doses of Serum in Treatment of Toxic Diphtheria.—Volovik asserts that massive dosage in serum therapy is highly effective in uncomplicated toxic forms of diphtheria. In moderately severe forms, final injection of doses of from 100 to 125 thousand antitoxic units of serum decreased the mortality from 16 per cent to zero; in very severe forms, injection of doses of from 200 to 300 thousand units of serum with an initial dose of 100 thousand antitoxic units decreased the mortality from 69 to 30 per cent. However, in hemorrhagic forms, large doses of serum did not bring about similar remarkable recoveries—mortality was decreased from 88 to 64 or 65 per cent. This may be explained by the premature presence of cardiac disturbance.

Abortion Without Sufficient Hospitalization.—Anufriev asserts that in the proceedings of the convention of obstetricians and gynecologists at Kiev in 1927-1928 it was decided that abortion was not an inconsequential surgical intervention and therefore could not be performed without hospitalization. It was reported that after the intervention there is a change in the reaction of the vaginal secretion and at the third day there is a microbic flora in the uterus (staphylococcus or bacilli) that indicates infection. It was decided that postoperative supervision should be continued for at least three weeks after abortion. Most postoperative disturbances occur in the endometrium: incomplete regeneration and the presence of necrotic tissue open the road to infection. Abortion was considered an important factor in the decrease of subsequent pregnancies in young women. It was decided that the medical profession should insist on hospitalization of patients during and after surgical abortion.

Hospitalstidende, Copenhagen

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Spondylolisthesis (Cont.). J. M. Wollesen.—p. 1019.
*Intracranial Aneurysm in Girl Aged Six Years. K. K. Ortmann.—p. 1026.
Sense of Vibration in Neuralgias. F. Bro.—p. 1031.

Intracranial Aneurysm in Girl Aged Six Years.—Necropsy disclosed that the sudden death without preceding illness in the case described by Ortmann was due to an extensive subarachnoid hemorrhage from the rupture of a sacculated aneurysm of the right anterior cerebral artery. Microscopically a distinct defect was seen in the media of the artery at the seat of the aneurysm. The author is inclined to believe that an embolic process during the child's grave diphtheria at the age of 3 had led to the formation of the aneurysm at this already weak place in the arterial system.